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ADDRESSES AND ORIGINAL ARTICLES

SOME LESSONS OF THE DISTRIBUTION OF INFECTIOUS DISEASES IN THE ROYAL NAVY.*

By Sheldon F. Dudley, O.B.E., M.D., M.R.C.P.Lond., D.P.H., D.T.M.,

SURGEON CAPTAIN, ROYAL NAVY; PROFESSOR OF HYGIENE AT THE ROYAL NAVAL MEDICAL COLLEGE, GREENWICH.

LECTURE I.

The eminent founder of these lectures in setting forth their object wrote: "I would express my strong desire that more diligent and continued attention may be paid . . . to the study of the geography of diseases together with the exact chronology of the appearance and persistence of those diseases which are only of occasional and temporary occurrence." I therefore feel the subject of my lecture would meet with Dr. Milroy's approval, and, moreover, I take encouragement from the fact that in suggesting the type of medical man who should be selected as lecturer, he says: "The medical officers of the Army and Navy enjoy specially favourable opportunities of investigating various forms of disease in different regions of the world, not possessed by most practitioners in civil life."

Introduction.

Since 1856 there is an unbroken statistical record of the health of the Navy on various stations all over the world. This record is in some ways unique as a statistical series, because the exact morbidity, mortality, and the number of days' illness caused by each disease is available throughout the whole period. Every case represents a man with a degree of illness such as to prevent him following his occupation. This occupation has remained with small changes much the same throughout the period. The frequency of the different types of occupation in a ship—for example, the relative proportion of officers, seamen, stokers, and marines—may have varied slightly in the period but are constant all over the world during any one year. In the late 'fifties steam was rapidly replacing sail in the Navy, so any influence this may have had on the frequency or type of disease acts throughout the period. The personal equation of medical officers is neutralised by the fact that those serving on one station in one year are serving on some other within the next three years. The standard of diagnosis and fashions in treatment are therefore, during any one period, comparable all over the world and reflect the averaged opinion and behaviour of some 400 to 600 medical men. There is only one standard that determines the day a man comes off the sick list, which is the man's ability to perform his duty; and the only judge who decides when a man is fit for duty is the medical officer. Unlike the civilian practitioner, the naval doctor cannot be subconsciously swayed by the fear of losing his patients if he and they should differ on the question of their ability to work. The naval surgeon can order reluctant subjects to return to duty, while contrariwise he can forbid impatient cases to work before they are fit. The patients themselves have much less inducement to try to stop on, or get off, the sick list before or after they are fit than civilians ashore, who are swayed by such considerations as drawing insurance pay, or losing a job and wages—influences which do not affect the sailor in the Royal Navy.

Throughout the whole period the sex and age grouping of the naval population has been practically constant. The men have been a physically selected A1 population; though this selection may have tended to get more efficient and rigorous as time passed on. At any one time the naval rations are the same as far as possible for each man throughout the world. The diet of the men has been greatly improved since the 'fifties, but may be considered constant for any short period of years.

DENSITY OF POPULATION.

An important factor in the spread of disease is the density of population. In the Navy this factor must approach the maximum possible throughout the whole period under consideration. It is conceivable that the population density of a ship of war may be equalled in a few other special environments such as Chinese inns or even certain tenement houses in English towns, but here the density is not continuous; the men go out to work, the women to shop, the children to school or play in the streets. The popular idea of the free fresh air life at sea dies hard. If one walks round the upper deck of a battleship at any time of the day unless some special drill or evolution is in progress, one will not see 50 men on the upper deck, yet somewhere below one's feet among the interstices of the machinery, living continuously in artificial light, and breathing air forced down to them by a multitude of electric fans, are a population more than a thousand strong. If one wishes to understand the points raised in these lectures it is essential to keep the extreme density of a warship's population continually in mind. The following description may help in visualising this type of environment.

On a hot night in the tropics when heavy rain squalls had forced all men to sleep below and the sea was too high to carry any scuttles—that is to say, when the ship was battened down—I visited the forward mess decks at 5 A.M. after they had been in full occupation for about seven hours. There were 60 men sleeping in the stokers' mess. The scene almost baffles description. Hammocks were slung from every available hook and stanchion and crossed each other in all directions, forming at least two layers of horizontal bodies. Some men, either because they could not find a slinging billet, or because they preferred it, were stretched asleep on the deck, others on and under the mess tables. The space seemed full of man, but by dint of crawling under some hammocks and stepping over others, a space large enough to swing a wet and dry bulb thermometer was found. When allowance was made for the men, machinery, lockers, and other impedimenta the air space was less than 100 cubic feet per man. Yet in spite of having just come out of the open air on the upper deck where it was blowing half a gale, the atmosphere on the stokers' mess deck seemed fresh and the smell of man scarcely perceptible. The temperature in the open air was, dry bulb 78°, wet bulb 73°. On the stokers' mess deck, the dry bulb temperature was only three degrees higher than that on the upper deck—namely, 81 and the wet bulb was 77. According to these thermometer readings scarcely any moisture had accumulated in the atmosphere from the lungs and skin of 60 sweating well-built naval stokers. The wet katathermometer figure was 10·5, which is quite a high index of comfort for men when acclimatised to the tropics. In my own cabin it was only 8·5.

The reason for these good figures in spite of what many would consider the densest overcrowding is, that 120,000 cubic feet of air per hour was being pumped into that stokers' mess; the whole

* The Milroy lectures delivered before the Royal College of Physicians of London on Feb. 26th, and March 3rd and 5th.

atmosphere was changed every three minutes. The degree of overcrowding has remained unchanged since Nelson's time; if anything, I should say that the density of population in a man-o'-war is greater to-day than 100 years ago, owing to the ever-increasing amount of machinery, and extra personnel to look after it, that of necessity has to be crammed into a modern fighting ship. The ventilation, on the other hand, could scarcely be bettered, whereas in the old days it was practically non-existent and in bad weather, necessitating the closure of all ports and hatches, some parts of an old line of battleship must at times have contained air approaching the condition of vitiation described by Sir Leonard Hill in North Sea trawlers where the CO_2 in the air of the battened-down cabin sometimes reaches a concentration so high that it puts the lamp out. Yet deep sea fishermen are a healthy group, and if they escape drowning, live longer than the average. I therefore think the importance of air supply per se in the prevention of disease has perhaps been overstressed. The beneficial effect of a rapid air change in confined spaces is more due to the flushing out of respiratory droplets and the cooling effect of moving air in the tropics, than to increase of oxygen supply and removal of CO_2.

The very nature of a warship, which is a honeycomb of closed compartments, which of necessity have to be water-tight and in bad weather are often completely blocked from any direct communication with the outside air, lends itself to the development of strong smells, while various inaccessible spaces such as the bilges are difficult or impossible always to keep sweet and clean. All through naval medical history one finds *post hoc* explanations worked to death. Peculiar smells, rotting timber, foul bilges, and decaying filth in the ballast, are reported over and over again as causes of sickness and epidemics. Even as late as 1914 a mysterious outbreak of typhoid fever in H.M.S. *Formidable* was considered by some officers as due to decayed organic matter in the cable lockers, until a chronic typhoid carrier was discovered and removed. Efficient ventilation removes or at least dilutes foul smelling air, and therefore perchance its prophylactic virtues have been largely founded on false premises.

There is another factor in the spread of infectious disease, which although it eludes measurement, yet is of great weight. This factor is what Stokes [1] has called "the circulation factor" in a community. Its value depends on the extent, rapidity, and quantity of movement among the members of a community and the amount of inter- and intra-migrations between neighbouring herds, subherds, and individuals, and in the type, duration, and closeness of the resulting contacts. In the Navy this circulation factor must have shown little variation for the last 70 years except in so far as its value was affected by variations in the rate of recruiting.

STUDY OF GROUP INFECTION IN A WARSHIP.

Thus in the Navy occupation, sex, age-grouping, physical condition, standard of fitness for duty, density of population, circulation factor, and the system and arithmetical accuracy of the sick records have remained practically constant for more than 70 years; while diet, the standard of medical diagnosis and treatment, and atmospheric environment (irrespective of climate) have in general been constant throughout the world at any given moment but have been gradually improving throughout the whole period. For these reasons differences in the morbidity and other characters of disease, which are found in the naval statistical records, can be more safely attributed to the changes in climate and the character of the biological agents of infection than is the case with other records, where the external environment and character of the host herd are subject to more complex and wider variations at different times and places.

The properties of a warship itself render it a valuable instrument for the study of group infection. A ship's company during a commission, usually three years in length, is a stable community free from all migration from without, and this group is carried about the world intact, complete with its immediate environment unaltered. The behaviour of the community in different places, climates, and seasons can therefore be easily compared. The medical officer sees, without exception, every man who is unable to work; he also has under his eye all those who are well, and also sees many cases who, while not in perfect health, are not incapacitated enough to stand off duty. In this respect the naval surgeon realises better than most how in some conditions—e.g., diarrhœa and influenza—there may be more people suffering from symptoms not severe enough to hinder them following their ordinary methods of life than would ever have been heard of by a doctor ashore. Moreover, at certain times and under certain conditions this community may be completely isolated from the rest of the world, and if then an epidemic arises its progress and development can be studied with the knowledge that no outside human agency can have interfered with the observed phenomena. The unique character of the naval community, the numerical accuracy of the records, and the intrinsic qualities of ships themselves, enable Nature to show an attentive observer some instructive and controlled experiments.

Natural Experiments.

Here is a well-controlled experiment on the ætiology of cholera.

On Oct. 22nd, 1862, during operations in China 211 men out of the 500 which formed the ship's company of H.M.S. *Euryalus*, proceeded to take a party of soldiers up river in flat-bottomed boats. The naval contingent drank the river water, but the army party took supplies of good water from Shanghai. Cholera broke out on Oct. 25th. The expedition returned to the *Euryalus* on the 29th, after four days' absence. During the following fortnight there were 39 cases of cholera and 54 of dysentery, and 29 men died. Not a case of these intestinal infections occurred among the soldiers. All these cases, with two exceptions among the nursing staff who got "choleraic diarrhœa," were among the sailors who joined the military expedition. Hence 44 per cent. of this ill-fated naval landing party developed cholera or dysentery after their return to the *Euryalus*, while during the same period less than 1 per cent. of the men who had remained on board got infected.

The surgeon of the ship interpreted this experiment as showing that the cholera and dysentery must have been conveyed by the polluted river water, since the disease only occurred among the sailors of the expedition. Notice the use of the two control groups of men. Those left on board showed that the ship itself was free from infection and could have had nothing to do with this epidemic, while the complete freedom of the other control group of soldiers who underwent exactly the same experience in the same boats as the attacked sailors, except that they drank pure water, definitely incriminates the river water as the source of infection.

I think this little naval disaster is a prettier and better-controlled experiment than the classical story of the Broad-street pump. It is true the naval episode took place 10 years later when the water-borne theory of cholera had been well established, but in this naval outbreak the air-borne theory of cholera, which in the early 'sixties still had many adherents,

is ruled out. Considering the density of a ship's population it is surprising that there was not more contaminatory spread from the sick sailors who had belonged to this ill-fated landing-party to other members of the crew who had not been on the expedition. It is also probable, though there is no mention of it, that the *Euryalus* was lying in an anchorage far enough off-shore to be tolerably free from flies. This inference is made from the result of another experiment, which shows the effect of the fly factor in spreading intestinal infection.

DIARRHŒA AND FLIES.

During the latter part of September and all of October 1924, H.M.S. *Barham*, in which I was then serving, lay at moorings in the centre of Valetta harbour. There were only three cases of diarrhœa bad enough to be stood off duty during this period. In November and December the *Barham* was docked in Malta yard. Forty-one cases of severe diarrhœa were "put sick" in November, 18 in December. She moved out of dock at the end of December, the diarrhœa incidence dropped to eight in January and to three in February. That is, the number of diarrhœa patients on the sick list was 29 per month while the ship was in dock as against an average of 3·5 during the two months preceding, and the two months following, docking.

Here a whole environment, complete with all its inhabitants, was moved half a mile from one locality to another in the same harbour, and the move coincided with an eight-fold increase in the sick list for infective enteritis. It may be added this increase in morbidity is an underestimate, because at least half the ship's company of over 1000 men suffered from a mild gastro-intestinal disturbance while in dock, which in more than 75 per cent. of instances was not sufficiently severe to justify their standing off duty. When a search was made for a possible cause of this epidemic of intestinal infection, it was observed that when moored in the centre of the harbour there were few flies in the ship, whereas while she was in dock, situated close to one of the dirtiest slums in Malta, there were swarms of flies in her, and no food could be left uncovered for a minute without being grossly contaminated by them. It was impossible to reduce the number of flies by trapping or "swatting" when they were recruited by the million from the garbage-strewn streets surrounding the dockyard. This epidemic is unlikely to have been due to contamination of food before its exposure to the flies in the ship, because the other ships moored out in the harbour used the same kinds of food from the same sources from which the *Barham* drew her supplies. These ships remained free from the fly nuisance; and their average morbidity from diarrhœa in November and December while the *Barham* was in dock was no greater than in October and January. This observation acts as a control to the *Barham* experiment of removing a community complete with its immediate environment from a comparatively flyless to a densely fly-infested locality.

CEREBRO-SPINAL FEVER.

The most marked characteristic of hygienic interest whereby a ship differs from the average environment ashore is a continuous and dense concentration of its inhabitants. Cerebro-spinal fever is one disease in which all authorities are agreed that overcrowding is *par excellence* a factor of great weight in the ætiology. Yet, in the sea-going ships of the Royal Navy, where the density of population during the war exceeded anything possible in the depôts and training establishments ashore, epidemic meningitis gave little trouble. The incidence of cerebro-spinal fever in the boys' training establishments ashore was over 30 times that in the sea-going squadrons from which only 64 cases were reported in the five war years (average strength over 150,000). This naval evidence, in the absence of the Army experience in their training camps, and J. A. Glover's classical work on the prevention of meningitis by spacing-out beds, might well have been used as an argument against the importance of overcrowding as a factor in the production of cerebro-spinal fever outbreaks. When I pointed out the peculiar relative freedom of ships from cerebro-spinal meningitis,[2] the hypothesis was put forward that, while a ship was in all respects an ideal environment for the development of meningitis epidemics, yet luckily they could not materialise in the Navy because all naval recruits underwent a preliminary training ashore prior to being drafted to sea. During this period they became salted or immunised against meningitis by contact with the numerous carriers of *Neisseria meningitidis* in the training depôts.

This hypothesis badly required a control experiment to support it, since there are truly a lot of differences in a life at sea which might in some unexpected way have inhibited the development of symptomatic infection with *N. meningitidis*. The necessary confirmatory experiment has been supplied by the recent epidemics of cerebro-spinal meningitis in ships carrying emigrants from the Philippines to the Western American ports. According to Geiger[3] the carrier-rate for *N. meningitidis* in these ships was only 2·5 to 4 per cent.—rates much lower than those found in ships of the Royal Navy during the war, and which, according to Glover, were unaccompanied by symptomatic infections among Army recruits, yet in less than three years 319 cases of cerebro-spinal meningitis were reported in ships transporting emigrants from the Philippines to Honolulu, Seattle, or San Francisco.[4] One ship produced 43 cases during the two months' passage, equivalent to 6 per cent. of her passengers.

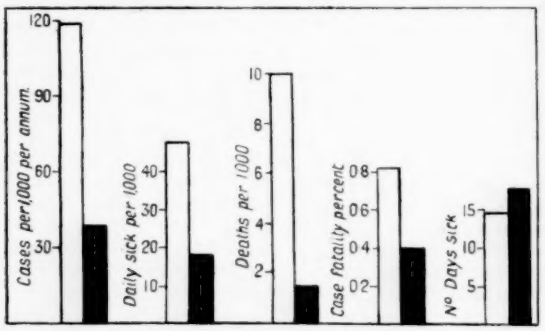
This must be a record morbidity for epidemic meningitis whose causal bacterium, under average conditions, produces some thousands of carrier infections to every case of meningitis. One must note two other important facts: First, in the same period, only three cases of meningitis were found among the emigrants in the concentration camp where they awaited embarkation from the Philippines. Secondly, the disease was practically confined to the passengers, only four cases were recorded among the mercantile seamen. This epidemic at sea among emigrants is good evidence that, provided a ship is populated with susceptible subjects, she is a better environment for the development of epidemic meningitis than even a concentration camp, and a pretty control experiment to the naval war experience on which the inference was made that, provided seamen had undergone a preliminary seasoning process in training establishments ashore, for practical purposes they were immune to epidemic cerebro-spinal meningitis, in spite of inhabiting an ideal environment for bacterial dissemination in which there were numerous carriers of *N. meningitidis*.

Total Disease: Distribution in Time.

I will now describe the alterations in the morbidity and mortality from disease as a whole that have occurred in the Navy during the last 50 to 70 years. Besides the above rates, the average period each case was on the sick list is available. For example, the cases recorded as enteric fever in the naval returns were on the average each 60 days away from duty, whereas men entered as influenza were on the average only six days on the list. Therefore, as regards damage to the working efficiency of a fleet, one case of typhoid is equivalent to 10 cases of influenza. Information as to the average duration of illness is rarely obtainable from other series of vital statistics. Fig. 1 compares these indices of sickness in the Navy for the five years beginning with 1860 and 1923 respectively. The diagrams refer to total disease, excluding all cases of injury and wounds in action. The horizontal row of figures are the ratio of the corresponding rates in the past to those in the present

period; they give a measure of the improvement in the health of the Navy which has taken place during the last 70 years. The improvement is most marked in mortality which is less than a sixth of the early period. Mortality, because of its importance in indicating preservation of life, is the most generally used index of the efficiency of modern methods of prevention and treatment in the Navy. Nevertheless, the use of mortality for the purpose exaggerates the improvement in health, since we see morbidity

FIG. 1.—*Health of the Navy, Past and Present.*



White columns represent averages from 1860–64; black columns averages from 1923–27.

has only undergone a threefold reduction. Therefore half the fall in mortality is, as the diagram shows, secondary to a halved case-fatality.

Examination of the records in detail indicate the fall in case-fatality is largely caused by three events. First, the practical disappearance from the Navy of the great killing diseases, cholera, small-pox, enteric, and yellow fever. Secondly, the earlier recognition of grave constitutional disease, and tuberculosis, has allowed more of such cases to be invalided to die outside the service where they cannot swell the mortality records of the Navy. Thirdly, modern surgery has undoubtedly saved many lives which would have been lost in former years. There is little evidence, however, that treatment, other than surgical, has had an appreciable share in the great decline in naval mortality. The most practical index of naval health is the daily sick per 1000, which indicates the quantity of disease irrespective of type and the yearly number of cases. This index shows less improvement than morbidity; because, strange to relate, the average time a subject is off duty in recent years has increased to 17 days, from 14 in the 'sixties, and 15 in the 'seventies.

DURATION OF SICKNESS.

At first sight an extra two or three days of illness per man sick does not seem very important, but when it is realised that, with a total disease rate of 385 per 1000 in a force of 90,000 men, an extra two days' sickness per patient means 69,300 days lost to the Navy, nearly two centuries of time, it becomes worth while examining these statistics more closely in order to see if there is a preventable cause for this increase in the duration of disease. For this purpose the figures in Table I. were abstracted, which compares details concerning certain groups of the more common infections which occurred in the two five-year periods beginning in 1874 and 1893. (The earlier period, 1874–78, was chosen because diagnosis and the record was more comparable to that of recent years than in the 'fifties and 'sixties.) The headings in Table I. require explanation.

"Fevers" are the so-called tropical fevers, they include enteric, malaria, the continued and remittent fever of the 'seventies, and the P.U.O. of recent years, but exclude yellow fever and the common eruptive fevers of childhood, the latter having a neglible incidence in the Navy. "Rheumatism" comprises rheumatic fever, subacute and chronic arthritis, and fibrositis. The "minor" respiratory group consists of sore throat, tonsillitis, nasal catarrh, and influenza of sufficient severity to have been entered in the sick records. The "major" respiratory group includes tuberculosis of the lungs, pneumonia, bronchitis, and pleurisy. "Disease of intestines" is not strictly comparable in the two periods, since in the early period this group consisted of only diarrhœa and colic (excluding dysentery), while in recent times this category includes about 20 per cent. of cases of appendicitis and other surgical diseases of the intestines. The latter conditions in the 'seventies were not recognised and most of them probably appear under other headings than "colic." The heading "Otitis" in Table I. consists of about equal numbers of otitis externa and interna and about 5 per cent. of other aural disease. I have coined the expression "minor sepsis" to distinguish the common pyogenic conditions of the skin and subcutaneous tissues, such as boils, whitlow, subcutaneous abscesses, and ulcers. Venereal disease includes all sequelæ as well as primary infections.

Table I. shows that although the incidence (cols. *a*) of all the common infections have fallen in the last

TABLE I.—*Relative Morbidity Past and Present.*

Cols. ..	(*a*)		(*b*)		(*c*)		(*d*)		(*e*)	
Disease group.	Rate per 1000 per ann.		Daily sick per 1000 per ann.		Mean duration in days.		Total cases.		Total days sickness.	
	E	R	E	R	E	R	E	R	E	R
							%	%	%	%
Fevers	58	7·0	2·0	0·29	12·6	15·1	6·2	1·8	5·2	1·6
Rheumatism ..	57	8·9	2·6	0·53	16·6	21·7	6·3	2·3	6·8	2·9
Minor resp. ..	147	112	2·6	2·38	6·5	7·7	16·1	29·1	6·9	13·2
Major	23	12	2·2	1·31	35	40·0	2·5	3·1	5·8	7·3
Dis. intestine ..	69	22	1·0	0·78	5·3	12·9	7·5	5·7	2·6	4·3
V.D.	114	76	9·0	5·37	28·6	25·8	12·4	19·8	23·6	29·8
Otitis	6	7	0·24	0·04	15·4	21·8	0·6	1·7	0·6	2·2
Vaccinia	—	8	—	0·16	—	7·3	—	2·1	—	0·9
Minor sepsis ..	244	31	7·9	0·87	11·8	10·3	26·6	8·0	20·7	4·8
Other diseases ..	199	101	10·7	5·9	19·5	21·6	21·6	26·0	27·8	33·0
Total diseases	917	385	38·2	18·0	15·1	17·1	100	100	100	100

E = early period, 1874–78. R = recent period, 1923–27.

50 years yet they have declined at widely different rates. For example, the fevers, rheumatism, and minor sepsis are to-day only about an eighth as prevalent to-day as they were in the 'seventies, yet the incidence of respiratory and venereal infections taken together still remains two-thirds of what it was in the early period. As a result of this unequal decline the double column *d*, giving each subgroup as the percentage of total infections, shows that whereas the relative importance of fevers, rheumatism, and sepsis have decreased about threefold since the 'seventies, the relative frequency of venereal and respiratory infections have markedly increased, and together now comprise half the total number of cases admitted to the sick list. Double column *e* gives the percentage of days of sickness due to each group of infections. It is noteworthy that although the minor respiratory group has the maximum relative incidence, forming about a third of all admissions at the present time, yet, owing to the duration of illness being less than half the average, minor respiratory infection is only responsible for one-eighth of the total days' sickness; whereas venereal disease, with its

long average duration of three weeks, causes about 30 per cent. of the total sickness of recent years, but only 20 per cent. of the total cases.

The increase in the length of the average illness is general in all the groups tabulated except venereal disease and "minor sepsis." But the duration of venereal infection is still so much above the mean for all infections, that the rise in the relative frequency of venereal disease will tend to have lengthened the average duration of total diseases, in spite of the fact that venereal disease is on the average a shorter illness to-day than in the 'seventies. Similarly, the relative infrequency of "minor sepsis" cases to-day as compared with 1870 will also increase the mean duration of total illness, because this class of case, though averaging to-day slightly less time on the sick list, always had a duration significantly below the mean of all sickness. Therefore venereal disease and minor sepsis, although the only groups whose mean duration has shortened, form a pair whose change in relative frequency has tended to lengthen the duration of disease as a whole.

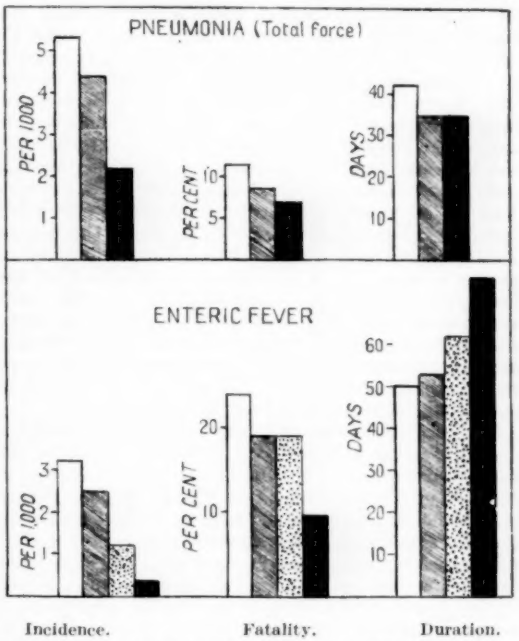
The growth of operative surgery is another cause of the more protracted nature of the average naval illness. For instance, the doubling of the mean duration of the cases called "disease of the intestines" and the increase in days' sickness due to "otitis" is due to both these categories, now including many operation cases which may spend two or more months in hospital. The same explanation applies to the group of "other diseases" in Table I. whose relative frequency and mean duration have both increased in modern times. This category includes many conditions such as hernia, varicose veins, and tumours which would rarely have appeared at all in the sick records of the 'seventies, but are now sent to hospital for a radical cure where they remain beyond the mean duration of total sickness.

Finally, the increase in the average days' sickness of the minor respiratory and other ailments of short duration cannot be attributed to surgical replacing medical treatment, and I believe the increment was largely produced by the greater use of hospitals in the modern Navy. In 1928, 67 per cent. of all illness occurred in hospital; in 1874, 36 per cent. of the total days' sickness was spent in hospital. And, if we take the most common trivial ailment, "catarrh," in the 'seventies only 10 per cent. of the days' sickness attributed to "catarrh and influenza" was recorded in hospital, against 30 per cent. at the present day. It is interesting to note that in still earlier times it was the habit to treat practically all disease on board. In the records for the Mediterranean Fleet of 1830, out of the total 9305 entries on the sick list less than 5 per cent. were sent to hospital. If a patient is in hospital there is less inducement and it is less easy to send him to duty at the earliest possible moment; because there is more room in a hospital, than in a ship's sick bay, and the question of arranging for transport back to duty does not arise in ships. Moreover, the hospital physician is loth to lose sight of his patient until he is convinced he is fit for full duty. The doctor of the ship, on the other hand, lets a man off the sick list with a lighter heart because he has him under observation all the time and can see his recent patient anytime after his return to duty and put him back on the list if his condition becomes unsatisfactory.

To sum up, the longer average duration of illness which is a feature of recent times is due mainly to increases in the relative frequency of surgical operations, hospitalisation, and venereal disease. Although the mean time each individual is sick has been increased, yet the days lost on each entry to the sick list may have been more than compensated for by better treatment, causing fewer recurrences of infection, and thus preventing the same man appearing in the sick records as half a dozen cases of short illness instead of one of longer duration. For example, a man with chronic appendicitis may appear time after time on the sick list with indefinite dyspeptic symptoms of a day or two's duration, if now his appendix is removed, though he may remain off duty for a couple of months, he may never again appear on the sick list.

Although it is a humiliating confession for a naval physician to make, yet there is not a scrap of evidence that improved medical as distinct from surgical treatment has had any effect in shortening the average duration of naval illness during the last 50 years. We can only hope that the treatment has improved, even if more prolonged, and that a considerable saving of life and recurrence of disability has been caused thereby, but the naval statistics are not in a form which can give much information on this point. I do not believe that disease in general has become naturally more protracted or treatment worse in recent years, and therefore, although these hypotheses were the most simple explanations of the facts summarised in Table I., yet they were at once discarded as being incompatible with all other experience.

FIG. 2.—*Incidence, Fatality, and Duration of Pneumonia and Enteric during Various Periods.*



For pneumonia the white columns represent 1872–76, the shaded 1903–07, and the black 1922–26. For enteric the white represent 1886–88, the shaded 1900–04, the stippled 1909–13, and the black 1922–26.

Pneumonia and Enteric Fever.

Two common killing infections, pneumonia and enteric fever, are used in Fig. 2 to contrast the changes that have occurred with time in the incidence, fatality, and length of illness. The pneumonia

histograms refer to three five-year periods which start in 1872, 1893, and 1922 respectively. Both incidence and fatality have satisfactorily declined, and the duration of illness, though showing no difference between the intermediate and recent period, does show a significant shortening since the 'seventies. It must be mentioned such conditions as empyema or abscess of lung may have often been diagnosed in the earliest period as pneumonia. Such conditions would not appear under this heading in the more recent periods. This would, of course, exaggerate the improvement in the fatality and length of illness figures, but for all that, I believe pneumonia to-day is a less fatal naval disease than in the 'seventies. How far this is due to better treatment, to change in clinical type, or even to the great increase in the sobriety of sailors it is impossible to decide.

The enteric statistics tell a somewhat different tale. Four quinquenniums have been selected—1886–88, when typhoid fever was relatively common and well diagnosed; 1900–04, shortly before anti-typhoid inoculation was introduced in the Navy. 1909–13, when though used, vaccine prophylaxis was but half-heartedly applied and, in my opinion, the dose inoculated was on the weak side; 1923–27, by which time the vaccine had been strengthened and its routine use and administration effectively carried out. There has been a steady fall in the incidence of enteric fever, and since improved diagnosis must have caused the recognition of mild cases of enteric fever which would formerly never have been classified as such, the fall in incidence must have been greater than it appears. Improved diagnosis probably accounts for some part, large or small, of the halved fatality in the last period. But I think the drop in fatality may partly be attributed to the effects of the prophylactic inoculation, because the decline only occurred in the last period and occurred at the same time as the duration of the disease was still increasing. Such an inference agrees with the Army's experience that the case-mortality in enteric fever is halved in inoculated, as compared with uninoculated.

The duration of enteric fever has steadily increased, especially in the last period. This may be due to the realisation that a long rest helps to prevent unpleasant sequelæ; but the halved fatality of the last period will appreciably increase the number of days' sickness. For instance, suppose the case of typhoid fever that recovers is on the average 80 days sick, and that fatal cases die in the second or third week, a reduction in fatality from 20 to 10 per cent. will lengthen the average duration of illness by about a week, which is the exact increase in the mean duration of enteric infections shown in the diagram for the last over the penultimate period. The improvement in the fatality from typhoid, if not artificial—that is, secondary to the diagnosis of more mild infections—is most likely caused by the prior experience of the specific bacterial antigen given in T.A.B. vaccine; because one of the most striking things about the enteric figures in these statistics is the small variation in enteric case-fatality from 20 per cent., from year to year and all over the world, until we come to deal with an effectively inoculated Navy. There is no evidence that improved therapeutics has played any part in this reduction of enteric fatality.

Distribution Ashore and Afloat.

In a previous publication [2] it was shown that in general the incidence of all infectious disease including such conditions as sore-throat, catarrh, rheumatism, and pneumonia was higher in naval training establishments than in sea-going ships. On two occasions only are the official naval statistics so presented as to give valuable confirmation of these earlier observations. In 1908 the "old" Home Station was subdivided into the "new" Home Station and the Home Fleet. The new Home Station included all the training establishments, and although at least as many trained, as untrained, men are included in this division of the Navy, yet the proportion of recruits is large enough to significantly effect the sick returns. The Home Fleet, on the other hand, consisted almost entirely of trained men in sea-going ships. In 1915 the Home Station, organised on the same lines as before the war, can be contrasted with the Grand Fleet.

Fig. 3 compares the average yearly incidence of some infections during 1909–13 in the Home Fleet and Home Station in peace time; and, in 1915, between Home Station and Grand Fleet during hostilities. Both sets of diagrams show that the prevalence of respiratory infection was twice as great ashore as afloat. The question arises, was this lower incidence afloat more likely due to a lack of opportunities for infection in ships than shore establishments, or to a greater susceptibility of recruits? Since the popular idea of a life in the Navy is that the majority of ships are most of their time at sea and the sailors have little opportunity of going ashore, it is as well to explain that in peace time, year in and year out, a ship in the Home Fleet was probably in harbour, or alongside a dockyard wall, on the average about six days out of seven. The trained men in ships got more leave privileges and therefore more opportunities of picking up infection outside their normal habitat than the untrained boys and recruits ashore, who were under stricter orders as regards liberty. When in addition one takes into consideration the closeness of contact in ship life unequal opportunity of infection can hardly be called on to explain the differences in the set of black and white columns which, during the years of peace, 1909–13, represent morbidity ashore and afloat. On the other hand, if only the 1915 war data had been available, lack of opportunity would have seemed the most reasonable explanation of the lower incidence of clinical infections in the Grand Fleet, which was then either at sea or in a bleak isolated harbour. In the war leave was restricted, and, when obtainable, often given in sparsely inhabited districts; yet if these peace and war diagrams are contrasted there is no significant difference in the two periods in the incidence of respiratory disease either ashore or afloat.

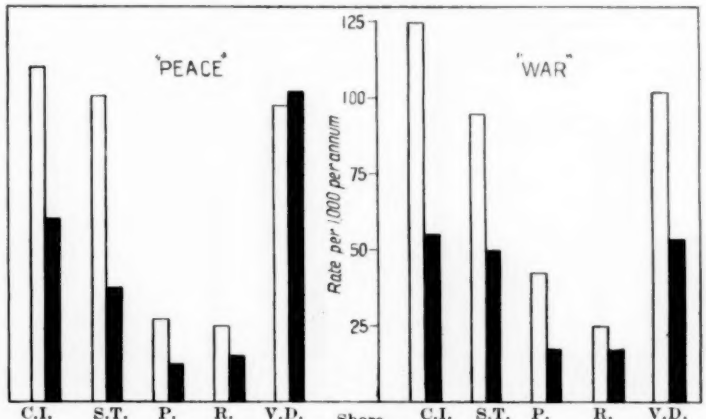
The ratio of incidence ashore to incidence at sea is given below each pair of columns in Fig. 3, and these ratios show little difference in the peace and war periods. Two other types of infections have been inserted as a sort of control. Rheumatism, which was also less prevalent among trained men at sea in both series, though the excess of morbidity ashore is not so marked as in the respiratory groups. The other control was venereal disease, and this group of infections are always contracted outside the ship. Other things being equal, the incidence of venereal disease is undoubtedly some function of the amount of opportunity for leave. In peace time, it was argued that opportunity for infection ashore could be no less in the Home Fleet than Home Station, and this opinion is confirmed by the equal incidence of venereal disease in the Home Station and Home Fleet of peace time.

EQUILIBRIUM BETWEEN HOST AND PARASITE.

In the Grand Fleet at war conditions had changed; opportunities for leave were certainly less than in the shore establishments. At the same time the incidence

of venereal disease was bisected at sea while remaining unaltered ashore. By using venereal disease as an index of contact with the outside world it was concluded that the opportunity for infection with other diseases from outside the fleet itself was less in the Grand Fleet in 1915 than in the Home Fleet before the war. In spite of this the incidence of respiratory disease was not significantly different afloat in war and peace. This implies that the great majority of these clinical conditions are contracted in the ship itself, and it is my conviction that the prevalent organisms causing respiratory disease are, as one might say, normal inhabitants of the ship which pass from man to man as subclinical infections but, according to a special concatenation of circumstances, cause sporadic symptomatic infections in subjects who, for some reason, become temporarily susceptible. Fresh but slightly different strains of the same specific organisms are, of course, continually being introduced from the shore. This prevents a permanent condition of equilibrium between host and parasite ever being attained.

FIG. 3.—*Disease-rates in Peace and War, showing the Ratio of Incidence on Shore to Incidence at Sea.*



White column = Home Station (27,000) Black column = Home Fleet (50,000)

White column = Home Station (53,000). Black column = Grand Fleet (127,000).

C.I. = catarrh and influenza. S.T. = sore-throat. P. = major respiratory. R. = rheumatism. V.D. = venereal diseases.

That such equilibrium can be attained in a small community in a relatively short time is borne out by the experience of polar expeditions which remain free from all symptomatic respiratory infection until their return to civilisation, when many of the members of the expedition at once succumb to catarrhal infections, intestinal as well as respiratory. Moreover, there is the instructive report of Heinberker and Irving-Jones [5] with regard to the polar Eskimos, 100 per cent. of whom get bronchitic colds whenever a European ship or expedition visits them, though the visitors themselves may be free from any catarrhal symptoms. This bronchitic epidemic lasts about three weeks, then the Eskimo community remains free from all symptomatic respiratory infection until the next visit, be it postponed for months or years. And I believe the unexpectedly low incidence of respiratory disease in warships is the result of an attempt towards such a condition of equilibrium between host and parasite, which, paradoxical as it may seem, is encouraged by the exceptionally high value of the density and circulation factor in ships.

The mechanism tending to produce a balance is one of fluctuating acquired latent immunity to potentially pathogenic organisms. Stokes [6] has demonstrated, almost beyond cavil, such a mechanism determines the incidence and periodicity of measles. It can be assumed, other factors such as dosage being equal, that an organism which can cause latent or carrier infection, as well as patent or clinical infections, will produce the one or the other in an individual according as his resistance to infection is above or below a critical level. In an environment where reinfections are common, the temporary rise in resistance produced by a previous infection will rarely have time to fall below the level where patent infection is possible before the subject again becomes infected latently. Therefore, in certain types of environment, where the product of density of population, circulation factor, and reservoir of infection is sufficiently high, the resistance of few subjects will be permitted to fall low enough in the intervals between infection for them to show symptoms of disease during the periods of active infection.

There are thus two possible explanations of a low morbidity, the usually accepted one, which may apply to sparsely populated areas, and which supposes that the inhabitants are completely susceptible but rarely come in contact with the disease-producing parasites, and the hypothesis just mentioned which applies to dense populations like the Navy, and suppose the whole population to be so frequently in contact with the parasite that their herd immunity is maintained at so high a level by latent infection that patent infection (i.e., morbidity) remains relatively low. In epidemics ashore doubtless many individuals escape attack because they are lucky enough to avoid all contact with the causative organism. But in a ship-of-war, if an outbreak of any magnitude arises, I cannot believe anyone on the lower deck escapes frequent contact with the biological agents, and the epidemic can only be terminated by exhaustion of all the susceptible material. Yet the total morbidity is often only a small fraction (5 or 10 per cent.) of the ship's company, and, even in influenza epidemics, rarely exceeds 50 per cent.

RESPIRATORY DISEASE AFLOAT AND ASHORE.

It is not easy to find figures to prove the contention that in the Navy the incidence, or rather time lost, from respiratory disease is less than in similar sex- and age-groups ashore. However, in this respect there are some recent statistics by Brundage [7] which show that the male employees of an American electric light company lost proportionately twice as much time from respiratory infection as the Home Station of the Royal Navy (including training establishments) and four times as much as the Atlantic Fleet.

The actual figures are:—*Electric Light Co.*: All respiratory infections, averaged for ten years, 3·2 days' sickness per man per year, "Colds" only, 1·4 days. *Home Station*, 1923–28: Total respiratory infections, 1·56 per man per annum; "Catarrh" only, 0·51. *Atlantic Fleet*: 0·72, total 0·26 "Catarrh."

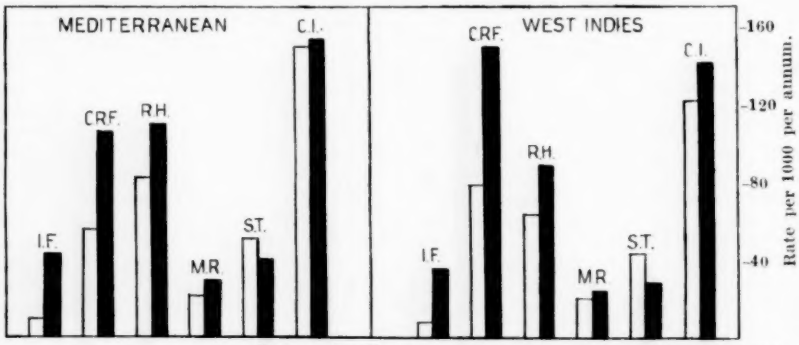
Examination of Brundage's tables show that any

difference in the age-incidence in the naval and industrial groups is inadequate to effect significantly the fairness of this comparison. Also, since there is no evidence that physical fitness in itself has any effect on immunity to respiratory infection, the lower morbidity of the Navy can hardly be ascribed to it being a physically selected population. What, however, might be a factor of immense weight in the higher recorded respiratory morbidity of the industrial group, and on which no data are given for the specific electric light company, is the presence or absence of a sick-pay scheme.

As regards this point Brundage gives a striking comparison of the relative frequency of sickness in two other industrial groups, one whose members were paid while ill, and the other who received no sick pay. The paid group reported three times the amount of sickness as the unpaid. Careful house-to-house visiting showed that malingering was a factor of little weight in the excess of time lost by the paid group. The group who got no sick pay could not afford to stand off work for minor disabilities or remain away till they were fully fit after more severe illness. In fact, the amount of disability in the two groups was practically the same; the recorded morbidity of the unpaid group was only so much less, because so many men were working while they were really unfit to do so.

In such a case the naval statistics would be more comparable to those of an industrial community, which, like the Navy, is not financially penalised by sickness. Therefore it appears safe to conclude that the amount of real disability, as opposed to recorded days off work, from respiratory disease, was much less in the Royal Navy than in the electric light company, which was used as a sample of the population ashore, even supposing this company to have had a sick benefit scheme.

FIG. 4.—*Differential Morbidity in Large and Small Ships during the Five Years 1861–65.*



	Large.	Small.
Mean No. ships per ann...	11·4	20·2
Aver. total strength	8000	2460
,, ship's complement..	700	122

	Large.	Small.
Mean No. ships per ann...	6·8	23·0
Aver. total strength	3500	3100
,, ship's complement..	510	135

Large ships = white columns; small ships = black columns. Ship's complements are corrected for time on station. I.F. = intermittent fever. C.R.F. = continued and remittent fever. R.H. = rheumatism. M.R. (major respiratory) = phthisis and inflammation of the lungs. S.T. (sore-throat) = cynanche. C.I. = catarrh and influenza.

Size of Ship.

There is another factor of importance in determining the total naval morbidity from some infections. This factor is "size of ship." It is only common sense that men in small gunboats employed up tropical rivers will be more prone to insect-borne diseases than ships that keep to salt water. But the large weight of this factor is not generally appreciated. The smaller a ship—not necessarily a sloop or river gunboat—the nearer in general will she anchor to the beach, and the more often will she tie up alongside jetties and moles. To show the effect of "size of ship" Fig. 4 was prepared. The period 1861–65 was taken when fever and rheumatism morbidity was high. Also in this period ships fell very distinctly into two groups, large and small. The selected definition of large ship was one with a complement of over 400 men, and a small vessel was one with a ship's company less than 400. (Over 90 per cent. of "large" ships had a crew exceeding 500, while over 90 per cent. of small had less than 300 men on board.) In order to get significant fever morbidities, foreign stations had to be used. The Mediterranean and West Indies were selected as during the 'sixties the largest number of big ships were employed on these stations. The disease showing the greatest contrast in incidence in large and small ships was "intermittent fever." This disease was undoubtedly malaria and its incidence in the "small" ships was fourfold that in the "large."

The group of diseases entered under the heading "Continued and Remittent Fevers" was a very mixed lot, but the bulk of these fevers were also probably malaria on both stations. This group also included typhoid and paratyphoid infections and a variable proportion of such conditions as dengue and possibly some influenza cases. In the Mediterranean a large fraction of remittent fever was undulant fever, and although "diagnosed" yellow fever was not used in making the West Indian diagram, some of the remittent fever recorded on this station was probably mild yellow fever—the so-called "immunising fever."

On both stations it is seen that the morbidity from "continued and remittent fevers" in large ships was about half what it was in small. The prevalence of both major and minor respiratory disease was not markedly different in the two groups of ships, except that the sore-throat incidence was significantly higher in the big ships of both stations. It is possible this was due to the fact that boys on first going to sea are generally drafted to big ships. The fact that proximity to the shore does not appreciably affect the respiratory morbidity is consistent with the deductions which were made from Fig. 3. For some unknown reason rheumatism is also more a disease of small ships. Seeing the supposed association of tonsillitis with rheumatism, the inverse association of these two conditions in the two groups of ships is interesting. The fact that rheumatism and fever are both definitely small-ship diseases makes one speculate as to if fevers, apart from undulant fever, have any weight in the causation of rheumatism. In Fig. 4 the known association of Mediterranean fever and rheumatism is well shown by comparison of the two stations. In the West Indies, although the incidence of total fevers was so much higher, yet the incidence of rheumatism was lower than in the Mediterranean Fleet.

The "size-of-ship" factor must have had great weight in causing the rapid decline of tropical fever in the Navy as a whole. The fall started in the late 'nineties, well before the intelligent application of antimalarial measures, or the control of undulant

fever. The great acceleration in the rate of decline of fever coincided with a period when the Navy doubled its total strength. Most of this increment of population went to the manning of big new cruisers and battleships, therefore the ratio of men serving in large, to men serving in small, ships was about doubled.

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THE PATHOLOGY AND TREATMENT OF VARICOCELE.

A NEW OPERATIVE PROCEDURE.

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THE possibility of cure of varicose veins of the lower limb by injection naturally directs attention to the treatment of varicose veins elsewhere, and the question arises whether the same method is applicable to varicocele. This extension of a new method, from the one condition where it has proved successful to the other, follows an obvious line of thought which is illustrated by a case recorded by Sir Everard Home over a century ago.

Home had reintroduced the principle of ligation of the internal saphenous trunk at the knee for varicose ulcer, and records details of 12 cases in which the operation was done. A certain number of patients made uneventful recoveries, but some suffered from varying degrees of sepsis often associated with operations at that time.

George York, who was a tailor by trade, had previously applied to several surgeons for relief from a varicocele, which made the scrotum so large and the testicles so uneasy that he could not follow his usual employment. He had already been told that the disease was due to enlarged veins, and he had seen two patients with varicose veins of the leg who had received considerable benefit from Home's operation. He attended St. George's Hospital, desiring to know if a similar operation could be performed on the veins of the testicle. The only answer made to this question was, "That I would not propose to him any such operation, having no knowledge of its effects, at the same time believed there was so little danger in it that, if he chose to have it performed, I had no objection to comply with his desires, although I did not feel myself authorised to take it entirely upon myself, I begged he would not at that time come to any resolution, but turn it in his mind before he came to a determination."

Eventually the operation, consisting of exposure and ligation of a convoluted vein in the cord, was performed on March 15th, 1796. The patient's condition caused some anxiety from the fourth day until the eighth, when the ligature came away and "he was well enough to take the bark." The slough separated by the sixteenth day and he was practically well by the twenty-sixth. The testicle and its vessels were diminished to one-half of the size they had acquired before the operation.

On Nov. 30th of the same year he returned to hospital with a view to having the testicle still further reduced. "The benefit he had received from the previous operation had so strongly impressed him with a belief that another operation would complete the cure, that all the arguments urged in favour of his being satisfied with his present state were in vain."

Accordingly Home agreed to this, since there was no apparent danger in taking up a large vein lying superficially in the spermatic cord, and this was done on Dec. 2nd. Convalescence was rather more satisfactory than before, but unfortunately, on the thirteenth day, "on account of some very indecent conduct, he was discharged from the hospital by order of the board, the wound being nearly healed. I have since heard that he imprudently exposed himself in the very severe weather about Christmas, caught a violent cold, which fell upon his bowels, and carried him off."

The bulk of evidence favours the view that varix of the lower limbs is produced by forceful refluxes into the superficial system from the deep veins of the limb and from the abdominal trunks.[2] The channels connecting the deep and the superficial veins of the leg are numerous, so that treatment by a series of injections given at sites rationally selected, and repeated if necessary, is likely to give satisfaction in a higher proportion of cases than the alternative operative procedure.

The object of the present account is to elucidate the pathology of varicocele with a view to determining both the value of the routine operation for this condition and the possibility of any improvement in the procedure. The points mentioned in text-book discussions of the ætiology are, that the left testis is usually lower than the right and the column of blood in the left spermatic vein therefore longer; that the left spermatic vein enters the renal vein at an angle and therefore there is more obstruction; and, thirdly, that the vein is further obstructed by the drag of the left colon crossing it when loaded, especially in constipated individuals.

The indications for operation given by Erichsen[3] are as follows:—

1. When the existence of a varicocele disqualifies the sufferer from admission into the public services. One of the cases in which I have effected a radical cure was that of a man in the prime of life, who, wishing to enlist in the Marines, was refused solely on the ground of his having a small varicocele. This I cured by operation, and the man afterwards entered the service.

2. In some cases the presence of a varicocele of inordinate size causes a distressing sense of weight and pain in the loins and groins, and often inability to stand or walk for any length of time. Here, when the patient is in continual discomfort or more or less prevented from pursuing his ordinary avocations, it is perfectly justifiable to resort to operation.

3. Cases not uncommonly occur where the pressure of the enlarged veins on the spermatic nerve produces repeated attacks of spermatorrhœa. These cases are, however, more frequently met with out of hospitals than in individuals of the class who apply to such institutions for relief. In fact, young men of the more educated classes are very subject to varicocele, especially those who habitually lead a sedentary and studious life, as, for instance, young clergymen and lawyers. In these persons a peculiarly hypochondriacal state is brought on by the tendency of the mind to dwell on the condition of the genital organs, and the patient is constantly fidgeting about the local and tangible disease he observes in them.

Before 1914 and early in the war, radical treatment for varicocele was a compulsory Army measure. The results obtained were by no means satisfactory for the conditions of active military service, and in the latter part of the war resort to operation was discouraged. At the present time inability to find any satisfactory line of treatment drives the teacher of surgery to avoid serious attempts to come to grips with this commonplace problem. After describing the unfortunate condition of the neurotic patient and enumerating a long list of the complications resulting from the ordinary radical operation, he usually finishes the discourse with a warning not to operate on the condition lest the last state of the patient be worse than the first. It is customary to add that, even if untreated, the symptoms of varicocele usually pass off, although the pathological condition does not improve. The condition in this way, however, is somewhat comparable to varicose veins elsewhere. During onset considerable distress is caused, but at a later date with worse function the patient often becomes less troubled.

Anatomy of the Spermatic Veins.

The spermatic veins on each side issue from the testis and epididymis and form the pampiniform plexus.

This plexus is one of the constituents of the spermatic cord, and consists of from eight to ten veins, most of which lie anterior to the ductus deferens. It passes upwards through the scrotum and enters the inguinal canal, where it resolves itself into two or three main trunks, usually one small trunk posterior to the cord and one large one, or two, anterior to it. These unite within a short distance of the inguinal ring and form the single spermatic vein which ascends with the corresponding spermatic artery. The whole extent of these trunks is therefore usually accessible after opening the inguinal canal.

With regard to the presence of valves in the spermatic veins, the following statements are found in Franklin's "Survey of Valves" [4]:—

Monro found ostial and parietal valves in the spermatic veins and their branches in man, but none in human ovarian veins.

Rivington concludes that there is a bicuspid valve near the orifices of human spermatic and ovarian veins, with few exceptions.

Piersol states that the right spermatic has an ostial valve, but otherwise there are no valves in the spermatic or ovarian trunks.

These factors which have so often been held to contribute to the condition suggest that vis-a-tergo is the actual productive force, while the determining factor is the increased pressure resulting from small mechanical obstructions. Reflux from abdominal and deep main veins is the chief factor in the causation

FIG. 1.

Photograph of anatomical specimen. Vena cava, spermatic veins, pampiniform plexuses. Injection at high pressure of the inferior vena cava in the normal subject, showing valvular protection at orifices of spermatic veins. The vena cava and left renal vein are grossly distended, but no fluid has entered either spermatic vein.

of ordinary varicose veins; the question arises whether varicocele is caused in the same way. Some experiments carried out on the cadaver throw light on this subject. Thus in the normal body the entrance to both spermatic veins is completely valved, and there is therefore no possibility of back-flow from the vena cava (Fig. 1). Injection of fluid down the spermatic vein itself in the normal subject showed that with little head of pressure the entire spermatic vein and pampiniform plexus filled. This injection was repeated over three or four cases and in each case the same result was obtained (Fig. 2). In no case was there the least resistance offered to the entire filling of the pampiniform plexus. When varicocele is present the left terminal valve is incompetent and the whole of the pampiniform plexus can be injected from the vena cava. This condition I have found post mortem in four cases with varicocele.

Cause and Treatment of Varicocele.

These findings suggest that varicocele depends primarily on this incompetence at the orifice of the spermatic vein, and further that the condition is produced by refluxes from the vena cava along the spermatic vein. In further support of this view it may be noted that in the majority of cases unilateral varicocele, which is usually left-sided, exists clinically with no apparent cause of mechanical obstruction to the venous return, not even constipation. It seems justifiable, therefore, to state that the force responsible for the varicose condition of the pampiniform plexus does not result from the vis-a-tergo of the blood stream, but from rises of intra-abdominal pressure transmitted along the unvalved left spermatic vein. Although this conception of the causation is of considerable importance theoretically, it does not appear at the outset more promising as a basis for practical treatment than does the accepted view. For the spermatic vein is a single channel, and if it is not naturally protected from refluxes by valves, what steps can be taken to secure the necessary protection from back-pressure for the portion of the pampiniform plexus that has only the lax tissues of the scrotum to support it?

The existence of competent valves within the plexus now becomes of primary importance, and further investigations were made on them. In several normal cases the pampiniform plexus was filled and dissection employed to trace out the anatomy of the veins, particularly in regard to valves. The average conditions found in six post-mortem cases are represented in the diagram (Fig. 3). There are either one or two anterior trunks present. Fairly frequently—four out of six cases—the posterior spermatic trunk has a valve near its termination, but lower down the other trunks often have competent valves. The valves are rendered useless because of the free communication between the trunks of the plexus, around which blood can flow downwards with increase of intra-abdominal pressure. Thus the fluid poured into the vein above finds its way to the lower end of the pampiniform plexus. It is, however, frequently possible, by an operation in which the trunks of the plexus are carefully explored, to excise the channels which are not valved, leaving a pampiniform plexus protected by two or three valves. In all cases examined either post mortem (six cases) or at operation (eight cases) there have always been found one or more valves which may be utilised to guard this channel. Fortunately, the veins thus valved lie within the inguinal canal and hence are adequately supported laterally during effort.

I conclude, therefore, that injection is not the most logical method of treatment for varicocele. Although it may achieve the same effect as the ordinary surgical operation in which a large portion of the plexus is excised, the amount of the varicose plexus obliterated is not so easily controlled by injection as by operation. It should, however, be noted that in the majority of cases in civilian practice the patient is more satisfied than the surgeon with the final result of the ordinary surgical operation. Corner and Nitch [5] reviewed 100

cases and found that 20 patients still suffered pain and four were even worse for the operation. However, in spite of the fact that a hydrocele was present in 23 cases, fibrosis of the testicle in 55, and atrophy in 21,

FIG. 2.

Radiogram of anatomical specimen. Injection at low pressure into the termination of the spermatic vein in the normal subject, filling the whole plexus.

FIG. 3.

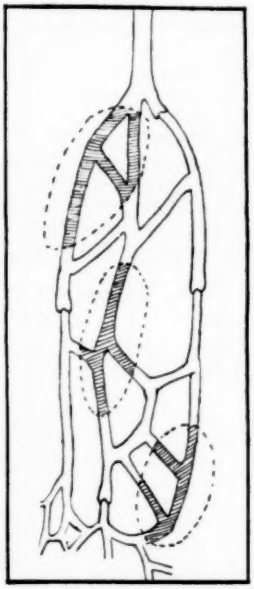

Diagram of formation of spermatic vein from three trunks at the level of the internal ring. The posterior trunk, shown on the right, is valved. The two anterior trunks are unvalved. By removal of the shaded areas a valved plexus is formed.

it was found that at least 70 of the patients were comfortable and well satisfied with the operation. If this represents a satisfactory standard of amelioration in this condition, it may eventually prove, when the results have been followed for a sufficient length of time, that the injection method will serve the purpose in the average case. In the absence of this knowledge, however, an operation reconstructing a valved channel out of the trunks of the plexus appears to be the procedure of choice.

OPERATION.

In varicocele giving rise to considerable inconvenience I recommend the following operation. The inguinal canal is opened and, by linear division of the coverings of the cord, the vas is exposed surrounded by venous trunks which terminate above in the single spermatic vein. These main trunks are carefully defined from above downwards. Valves in these channels present themselves as dilatations. The competence of any particular valve is proved by the absence of reflux of blood downwards after the segment of vein below has been emptied upwards. The upper two inches of the trunks usually contain two or three valves. Excision of the unvalved routes is next carried out, leaving a channel including a number of competent valves (Fig. 3).

The dissection of the plexus is continued down to the testis and the greater part of its lower portion removed. In doing this care must be taken to have the veins clearly dissected before ligatures are applied to them. Ligation "en masse" is unnecessary and may be responsible for the inclusion of arterial and nerve elements, with the consequent introduction of other factors incompletely understood. It is a reconstructive operation on veins and therefore should be confined to veins as far as possible. If no competent valves can be found, this procedure is not applicable and the surgeon is compelled to resort to the ordinary operation of partial excision.

This operation is obviously more tedious than the ordinary one, but it seems fair to claim that it is the only one that makes a rational attempt to restore a normal valve-protected path for blood returning from the testicles.

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CIRCUMCISION UNDER LOCAL ANALGESIA,

WITH THE APPLICATION OF A CONTINUOUS SUTURE.

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AT the male London Lock Hospital the routine examination of 500 to 700 venereal disease cases a week led my attention to the fact that 20 per cent. of patients needed circumcision; these cases included such acute conditions as phimosis arising from preputial chancres or gonococcal ulceration. Circumcision could only be performed by inducing the patients to take an hour off from work and assuring them that no general anæsthetic was required and, moreover, that no pain would be felt.

Thus was introduced circumcision under local infiltration with novocain and adrenalin, and the subsequent application of a continuous suture to prevent secondary hæmorrhage. The whole procedure is performed in ten minutes in straightforward cases, and very few cases require general anæsthesia. The old method of circumcision under gas proved to be a rush job, and the cases had to be detained some hours, with the likelihood of recurrent hæmorrhage due to the venous congestion induced by the nitrous oxide administration. The anæsthesia being a short one, the sutures were quickly tied, and the interrupted method did not produce such a fine line of coaptation as that of the continuous suture. Moreover, these sutures were found to cause painful erection by their irritation and friction, besides sticking to the dressing and sloughing-out.

On an average 120 men were circumcised at the London Lock Hospital each quarter. The method is suitable for cases in which phimosis has not persisted long enough to produce too severe a phagedæna of the penis or an extensive suppuration of the prepuce, which contra-indicates the infiltration with novocain. In primary phimosis the skin and mucous membrane are directly infiltrated with novocain by retraction of the prepuce; in secondary phimosis, where the prepuce cannot be retracted, the skin is infiltrated and a dorsal slit is first made; this gives access to the mucous membrane around the corona glandis, which is infiltrated in its turn. In my opinion, a dorsal

slit should always be immediately followed by circumcision whenever possible. The area laid open to sepsis by a dorsal incision is as likely to open up fresh areas to sepsis as a complete circumcision; very few patients return for a complete circumcision later, and the permanent result is a glans surrounded by a mass of redundant tissue, which is very liable to ulceration in patients subjected to the risk of venereal reinfection.

However septic the prepuce may be, the area is so vascular that the ultimate healing of the wound is astounding; a case of early gangrene is aborted by complete excision of the prepuce and submucous tissue.

Technique.

The method employed is so simple that straightforward cases could be treated on the ordinary examining couch of a consulting room. The penis is shaved, an antiseptic solution is applied, and a 2 per cent. solution of novocain with equal parts of adrenalin 1/10,000 is infiltrated over the skin area corresponding to the corona glandis. The prepuce is retracted and the reflection of membrane from the corona to the prepuce is well infiltrated with the solution, about 10 c.cm. in all being injected. The success of the procedure lies in using a large amount of solution, for the submucous layer becomes so infiltrated that a localised œdema is produced, and this places the venous supply well away from the advancing knife or scissors. The only hæmorrhage which usually results is from the cut membrane of the corona glandis and the artery at the frenum. After the injection, the end of the penis is massaged and no excision is made until complete ischæmia shows that analgesia and hæmostasis are complete.

The actual surgical method depends upon the requirements of the operator and the degree of phimosis. The use of phimosis clamps in general practice is to be preferred when the condition permits, for it gives an elliptical incision, owing to the mechanical precision of the device. Again the experience of the surgeon is called for in deciding how much membrane is to be excised. If the penile skin is sacrificed at the expense of the reflected membrane from the sulcus to the preputial margin, then a good result follows, as this avoids the risk of adhesions and the likelihood of a roll of prepuce forming over the sulcus later.

APPLICATION OF A CONTINUOUS SUTURE.

It was found that the application of a continuous suture became a necessity in those cases where time and the prevention of recurrent hæmorrhage were essential. The suture is best commenced from the dorsal aspect of the circumcision, the free end being secured by retaining forceps, whence it is carried round in an elliptical manner through the opposed edge of the penile skin and the mucous membrane of the glans. The frenum is clamped into correct alignment with the median raphe of the shaft and so the deformity following torsion is avoided. The stitch employed is of the simple oversew type and will secure the frenum well into position when the clamp is removed and the suture carried on to its commencement, the two free ends being tied off at the dorsal aspect of the penis. It is advisable to select the dorsum as the site for tying off, as a knot at the frenum is apt to cause ulceration, since the two ends of the suture cause more irritation at this site where friction and the accummulation of moisture are likely to occur. In applying the continuous suture, the stitch should not be drawn through too tightly but should be lax enough to enable the serum to exude between the everted edges of the wound. Sloughing out of the catgut is thus avoided, and in the event of secondary hæmorrhage no extravasation of blood into the penile and scrotal tissues is likely to occur.

The following points are worthy of consideration:—

(*a*) The avoidance of a baggy tissue mass at the frenum, which almost always appears as a slight degree of paraphimosis. This "baggy frenum" is avoided by thoroughly excising the redundant tissue at the frenum and leaving no excess of membrane, for if the frenum is incised in the primary incision no harm accrues, as good coaptation is effected by immediate suture of the opposed margins and the glans become well anchored down.

(*b*) The avoidance of the bent penis which appears on erection if the median raphe on the ventrum has been twisted and sutured to the dorsum of the excised coronal edge of the glans. It is the result of rotation of the corpora within the penile covering.

Reasons for Circumcision.

Circumcision is indicated in all ulceration which involves the prepuce and glans, whether simple or specific. In the first case, it serves as a means of draining the pent-up discharge around the sulcus and avoids the likelihood of gangrene. In the second case it avoids the liability to chancre redux some years later. The so-called venereal warts, really due to smegma and moisture collecting around the coronal sulcus, are permanently removed by circumcision. How many warts and epitheliomata of the glans penis are seen in the circumcised?

The only contra-indication to the continuous suture is where a chancre or soft sore appears in the line of the wound; in this case interrupted sutures at some distance from the sores are indicated. Incidentally I found syphilitic or soft sore ulceration to be no contra-indication to circumcision, provided the case was receiving suitable treatment—viz., novarsenobenzol or tartar emetic.

The after-treatment consists in keeping the sutures moist with ribbon gauze soaked in a preparation of vaseline and acriflavine. Thus dressing prevents sticking and is antiseptic, so that the first change need not be made until the second day, the sutures being removed on the fifth day.

Cases of recurrent herpes preputialis, involving prepuce and glans respond immediately to circumcision. As this complaint may become a very aggravating and worrying one to the sensitive patient, it is worth advising operation. Likewise I have found circumcision prove a definite cure in masturbation cases, as the sensitive coronal tissue has been removed and replaced by less delicate tissue, so that part of the reflex, as it were, had been interfered with and a sensory stimulus was less easily provoked.

Through routine examination of many hundreds of venereal patients, I noticed that most cases of primary sores found on the corona and glans arose in the non-circumcised; for, proportionately, Jews contract more gonorrhœa than syphilis. This is accounted for, in my opinion, by the fact that the preputial reflexion from the glans consists of more delicate tissue than the partially keratinised epithelium produced after circumcision, by exposure and friction, at the coronal sulcus; the latter is therefore less liable to inoculation by the *Spirochæta pallida*.

DEWSBURY GENERAL INFIRMARY.—The cost of in-patients at this hospital in 1930 was £129 3*s*. 10*d*. each occupied bed as against £118 1*s*. 4*d*. in 1929. The cost per patient is £5 6*s*. 3*d*.

THE MANTOUX TEST.

AN ANALYSIS OF 500 CASES.

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IT was thought that it might be of interest to perform the Mantoux test for a period of time on all children admitted to the East London Children's Hospital and to see how the results obtained in the slum district served by this hospital compared with those observed in America and elsewhere. The reaction was used as a routine from the middle of January to the middle of April, and the results in 250 children tested are recorded below. Subsequently the use of the test was confined to certain selected cases with a view to aiding diagnosis, and the results of a further 100 such cases are given. In November the routine use of the test was recommenced and 150 children were tested between then and the end of the year.

In this third group, the findings of which follow, special care was taken to avoid the sources of error to which experience has shown the test is liable. The main sources of error are as follows: (*a*) suppression of the reaction due to diminution of skin sensitivity during acute illness associated with fever[1]; (*b*) suppression owing to the severity or extent of the tuberculous infection—e.g., miliary tuberculosis[2]; (*c*) suppression due to altered allergy as the result of recent illness—e.g., during convalescence after measles.[3] Furthermore, such of those cases amongst the first 250 as gave reactions which might have been invalidated by the foregoing sources of error were reconsidered as to the history and to the presence of pyrexia at the time the test was performed. In 20 cases a second test was made at varying intervals from one to eight months. Finally, in this third group, the area of erythema and pigmentation was measured in every positive case.

Technique and Results.

The usual technique was followed—viz., the use of 0·1 c.cm. of 1/1000 Old Tuberculin (equivalent to 1/10 mg.) intradermally. Human and bovine tuberculin were both used in the first 50 cases, until it became apparent that there was no difference in the reaction to the two types—a positive human always yielding a positive bovine and a negative human always a negative bovine also. This was repeated in a small series in Group 3 with identical results. The tuberculin was prepared in the usual way by dilution with normal saline, and 0·5 per cent. phenol was added as preservative. It was found that the solution would keep for several weeks on ice without any evident deterioration, and frequent checks were made to ensure reliability of results.

An all-glass syringe and special intradermal needle are almost essential, as experience showed that the reading of the result could be grossly misleading unless the tuberculin had been injected entirely intradermally. No blood should ever follow the withdrawal of the needle, and there should be a raised dead-white wheal a quarter of an inch in diameter. To get a satisfactory wheal it is advisable to grip the forearm at the site of injection very firmly and exert considerable tension on the skin, when the insertion of the needle is not felt at all and even a small child will remain quiescent. The flexor surface of the mid-forearm makes a satisfactory site. The left arm was used in all cases in this series so as to obviate mistakes in the subsequent readings. Control tests were not made, as Smith[1] showed that they were unnecessary.

Readings were taken after 24 and 48 hours in all cases, and in the cases yielding positive reactions observations were carried out every other day subsequently until discharge. The positive reactions fell into two main groups, which differed in the intensity of the local manifestations. In both there was, at the site of injection, a circular or elliptical wheal of varying diameter up to 1½ inches. This was composed of two definite strata—an outer erythema and an inner brawny œdema. In the more acute type there was also a central vesicular area, and the extent of the erythema was greater. The outer layer faded more quickly, usually after three to five days; the other area desquamated in its entirety and the brown discoloration persisted for two to ten weeks. This discoloration is the essential part of the positive reaction and seems to be the "constant," in contrast to the erythema and vesicle formation, which probably vary with the state of sensitivity of the patient at the time of injection.

In no case was there any constitutional reaction or regional gland involvement. It seemed in many cases that the most acute reactions occurred in children with active disease (as opposed to infection), but further observations will be necessary before this can be accepted definitely. At any rate the acute reactions in young children and infants proved to be of bad prognostic significance, but in the older children this was not always so. In the negative reactions, the wheal disappeared an hour or so after injection and nothing further was visible on the arm at any time.

ANOMALOUS REACTIONS.

A. *Pseudopositive.*—Three times after bovine, and five times after human tuberculin had been injected, transitory areas of erythema were observed for 6 to 24 hours around the site of injection. There was no induration, the area was small and irregular in outline, and by the following day all erythema had entirely disappeared. These cases, clinically, gave no evidence of past or present infection with any form of tuberculosis.

B. *Delayed Positive.*—In six cases the appearance of the skin reaction was delayed for varying times up to eight days. One was in a scrofulous child admitted for debility following measles. This reaction was delayed for four days, but then became a typical positive, the desquamated area being visible for three weeks. Another was delayed for eight days in a child with tuberculous peritonitis who developed a faecal fistula from which the specific bacilli were obtained. Another was delayed for seven days—also a child with tuberculous peritonitis who subsequently died from a cerebral abscess following mastoiditis. The other three (one in a tuberculous pleurisy, one in a pneumonia, and the third in an osteomyelitis) were all tested during fever. The first may be explained by Mitchell's work[3] and the remainder by Smith's,[1] for while the second and third were not actually febrile at the time of the test, they were both running intermittent temperatures. In the child with pneumonia, the reaction became positive after 24 hours with a second dose of 0·2 mg.

Unselected Cases: First Group.

Group 1 consisted of 250 unselected cases, and gave the following results:—

Positive: 60 (24 per cent.). Confirmed by biopsy, autopsy, or bacteriologically from the cerebro-spinal fluid or sputum, 12 (25 per cent.). Confirmed suggestively by X rays (joints and thorax) 9 (15 per cent.). There was no clinical or X ray evidence in 39 (60 per cent.).

Negative: 190 (76 per cent.). One of these was found at autopsy to have tuberculous meningitis. This case (an infant of 1 month) was the only negative in this series which subsequently showed evidence of tuberculous infection. He was only tested once, with 0·1 mg. There was no fever at the time the test

was made, so presumably the explanation offered by Happ and Casparis[2] that in extensive tuberculosis the reaction may be negative unless a large dose (e.g., 1·0 mg.) of tuberculin be used may account for the failure.

The high percentage of "positives" without any clinical evidence suggests that infection with tuberculosis is not uncommon, and the majority of these gave the less acute type of positive reaction. This also lends evidence to the endogenous theory of adult tuberculosis—viz., that it is the third stage of tuberculosis in childhood. It is in such cases that prophylaxis may be of real value, and if these children are treated as potential tuberculous patients their ultimate outlook may be greatly improved.

The following case reports show the manner in which the test may be of diagnostic value.

NEGATIVE REACTIONS.

CASE 1.—A boy of 9 years had been treated here three years previously for "tuberculous cervical adenitis." He had been at a seaside home for two years, and the glands in his neck broke down repeatedly. He was admitted in March, 1930, for reinvestigation. The Mantoux was negative with 0·1 and 0·2 mg., both human and bovine. Examination of the neck revealed a large sloughing area at the site of the "breaking-down gland," and this ulcerated surface looked suspiciously like a gumma. There were no other stigmata of congenital syphilis, but the Wassermann reaction proved to be strongly positive, and under antisyphilitic treatment the ulcer cleared completely in a few weeks, and his neck is now healed.

CASE 2.—A boy of 1 year and 5 months was admitted because of "convulsions." Lumbar puncture showed a fluid containing 60 lymphocytes per c.mm. A diagnosis of tuberculous meningitis was made and the prognosis formed accordingly. As the infant got better day by day (subsequent lumbar puncture showing four lymphocytes per c.mm.), he was finally discharged quite well, and still remains so. His Mantoux was negative on admission, and was repeated two months after his discharge, when it was still negative. This was presumably a case of serous meningitis, as there has been nothing to suggest a poliomyelitis or encephalitis.

CASE 3.—A girl of 2 years was admitted from the out-patient department as a case of bronchiectasis, and the diagnosis was confirmed by lipiodol injection. She developed fever, vomiting, and drowsiness, and looked a typical tuberculous meningitis. Her Mantoux (human and bovine) was negative. The condition cleared up, though she went through a similar phase twice subsequently. This was a case of recurrent "pneumonitis."

CASE 4.—A boy of 2 years was admitted in convulsions. Lumbar puncture showed 350 lymphocytes and a protein of 30. The Mantoux was negative and, though he appeared drowsy and pyrexial for some days, the cell count in the cerebro-spinal fluid fell gradually, and he made an uncomplicated recovery. This was probably a case of poliomyelitis (absence of the right knee-jerk being observed subsequently). At first it was thought to be a tuberculous meningitis, but this was negatived by the protein content of the cerebro-spinal fluid, Grey[4] having shown that a protein of only 30 definitely excludes a meningitis.

CASE 5.—A girl of 10 months was admitted because of "loss of weight and limping on left leg, and pain when left hip was touched." The Mantoux was negative. After three weeks she developed a psoas abscess, which on incision yielded a pure culture of *Streptococcus hæmolyticus*. After three blood transfusions she made an uninterrupted recovery.

CASE 6.—A girl of 5 years was admitted in coma, which had lasted for 24 hours. Clinically she looked as if she were suffering from tuberculous meningitis. The cerebro-spinal fluid showed 250 lymphocytes and a protein of 30. The Mantoux was negative. She had been vaccinated 14 days previously. The child died after ten days from post-vaccinal encephalitis. At autopsy there was no evidence of tuberculosis anywhere.

The East London Hospital has a certain number of beds reserved for London County Council cases of tuberculosis. These cases may be admitted for observation, diagnosis, or special treatment (e.g., tonsillectomy). The routine Mantoux on these children has been most valuable. Thus:—

CASE 7.—A girl of 11 years was admitted as a case of "tuberculous peritonitis." She suffered from occasional bouts of fever, vomiting, and pain in the abdomen. The Mantoux was negative. At laparotomy a chronically inflamed appendix was found, but there was no evidence of tuberculosis.

Several cases sent in as tuberculous have been cleared of this stigma and enabled to return to normal life. There are many children who do not gain weight, have cough, occasional slight fever and "suggestive extension of hilar shadows," and a good percentage of these are not tuberculous. In such cases the Mantoux test is of real value.

POSITIVE REACTIONS.

CASE 8.—A girl of 2 years was admitted with bronchopneumonia following measles. Her Mantoux was strongly positive. The illness ran a "stormy" course, including an acute pneumococcal cervical adenitis. The child was finally discharged to the hospital's convalescent home at Bognor, but she returned four weeks later with tuberculous meningitis, from which she died after 20 days' illness.

CASE 9.—A girl of 9 months was admitted with vomiting and loss of weight. Her Mantoux was strongly positive. Tuberculous meningitis developed and was confirmed at autopsy (the cerebro-spinal fluid showed lymphocytes 400 and protein 110). There were five children in this family, all under 14, and after the death of the patient they were brought up by the parents for a Mantoux test. Only one showed a positive reaction—the eldest boy, aged 13 years, and he had been the only one to nurse the infant.

CASE 10.—A boy of 1 year was admitted because of a swelling in each groin. The swellings had been noticed for about six months, and were getting bigger. The Mantoux was strongly positive. On examination he was found to have two buboes, and the pus obtained therefrom at operation showed tubercle bacilli. This was a case of tuberculous inguinal adenitis following ritual circumcision.

CASE 11.—An infant of 1 year and 4 months was admitted with an empyema following pneumonia. It was apparently a straightforward metapneumonic empyema, and the organism was a pneumococcus. Despite a negative family history of tuberculosis, the Mantoux was found strongly positive, though there was no clinical evidence of any active lesion in the patient. Rib resection was performed, and the child seemed improved. Eight months later, however, the wound was still discharging freely, and signs of developing amyloid disease becoming evident.

In all non-clinical "positives" a routine radiogram of the chest was taken, and while the majority of these were negative or inconclusive, three showed "pleuro-mediastinitis" shadows such as occur not infrequently in tuberculosis (or epi-tuberculosis). All three cases did well after a long spell at the seaside, and on return the radiograms showed that considerable improvement had taken place.

Selected and Unselected Cases.

In a selected group of 100 cases the test was performed purely as a diagnostic aid, and only those cases suspected of tuberculosis or in whom it was particularly important to exclude tuberculosis as the cause of the symptoms were included.

The results showed 38 per cent. positive and 62 per cent. negative. These children were suffering from chronic lymphadenitis, debility, "P.U.O.," cough, abdominal pain, or diarrhœa. That the percentage of "positives" in this group was higher than in the first group (38 as compared with 24) is not surprising, seeing that some of the latter were healthy children admitted for herniotomy, &c., and in the majority of whom there was no suggestion of tuberculosis.

Some of the children in this group were collected from the out-patient department of the hospital, and here there were two classes of children particularly prolific of positive reactions—viz., those attending the ophthalmic out-patient department and those attending the rheumatism clinic. The former group were characteristically scrofulous, and many were malnourished children with phlyctenular conjunctivitis. In this connexion it is interesting to

recall Dickey's results [5]; he found a family history of allergy in a large percentage of the cases with conjunctivitis, and considered the conjunctivitis was evidence of the patients' hypersensitiveness to tuberculin in the same way that asthma may be evidence of hypersensitiveness to pollen, &c. The high percentage in the rheumatic group perhaps hardly admits of fair comparison, because these children were all older and therefore more liable to react positively.

Further Unselected Cases.

In the third group, of 150 unselected children, there were 26 positive (18 per cent.) and 124 negative (82 per cent.). Of the positives, ten were "acute," 16 less acute. The average area of erythema observed was 250 sq. mm., and of desquamation and pigmentation, 130 sq. mm.

Necrosis at the site of injection occurred in one case only in the whole series. There was no accompanying adenitis. The patient was a boy of 5 years who had purpura hæmorrhagica. He was bleeding (epistaxis and crops of purpuric spots) at the time of the test. One week later, during which there had been no further purpuric manifestations, he was retested, and no necrosis was observed.

The figures obtained from the 400 unselected cases grouped together are as follows: Positive 86 (21·5 per cent.); negative 314 (78·5 per cent.); number of cases confirmed, 31 (23 ante mortem and eight post mortem).

In view of the time taken for a tuberculous lesion to heal completely, it is as well to regard any child under the age of 7 years with a positive reaction as needing active treatment, whether this be merely extra open-air or added amounts of vitamin D in the diet in the hope of promoting calcification around the focus of infection.

Conclusions.

1. The Mantoux test is extremely valuable in children. It is easy to perform and is quite painless to the average child.

2. Care being taken to exclude the sources of error mentioned, a negative result excludes tuberculous infection and is a comforting finding in debilitated children after measles, whooping-cough, and bronchopneumonia, and in cases of chronic cervical adenitis and so-called "intestinal indigestion."

3. A strongly positive result in young children suggests active tuberculous disease and usually justifies a bad prognosis.

4. A mild positive result indicates tuberculous infection (not necessarily disease), and children showing such a reaction would benefit from open-air treatment and increased prophylactic precautions.

I am indebted to Mr. Acton Davis, Dr. Geoffrey Bourne, and Dr. Kenneth Stone for permission to use their case reports.

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1. Smith, C. H.: Amer. Jour. Dis. Child, 1929, xxxviii., 1137.
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4. Grey, F. T.: Arch. Dis. Childhood, 1930, v., 187.
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CLINICAL AND LABORATORY NOTES

TRAUMATIC RUPTURE OF THE NORMAL SPLEEN.

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Cases of spontaneous rupture of the pathological spleen are fairly common, as are also cases of direct traumatic rupture. Cases of spontaneous rupture of the normal spleen, on the other hand, are exceedingly rare. Hamilton Bailey [1] states that he could only find nine authentic cases in the literature in addition to the one which he records. M. P. Susman [2] describes two cases which were at first thought to be cases of spontaneous rupture, but where subsequent inquiry elicited a history of a blow at some previous date. The case here recorded falls into this last category.

The patient, a married woman aged 34, was admitted to hospital on June 23rd, 1930, with the following history.

On waking up that morning she had not felt very well and had only had a cup of tea for breakfast. About 10 o'clock she was seized with a severe pain in the epigastric region, which brought her to her knees. She did not vomit either at the onset of the pain or at any subsequent time during the day. The pain persisted all day, nothing giving her any relief. About midday the relatives noticed that she was beginning to look pale. On admission at 9.30 P.M. she was extremely pale and looked very exsanguinated. Her temperature was 97·6° F., her pulse-rate 120, and her respiration-rate 28. There was no marked restlessness or air-hunger.

There was a generalised tenderness on pressure all over the abdomen, most marked in the right hypochondrium. There was also tenderness in the left hypochondrium, but no rigidity either at this point or anywhere else in the abdomen. The patient complained of severe pain in the left shoulder region (Kehr's sign), which was worst on taking a deep breath. There was, however, no cutaneous hyperæsthesia over the shoulder. The area over the stomach and over the anterior surface of the left lung, up to the level of the third rib, was tympanitic on percussion. There was dullness in both flanks which seemed to shift on movement, but this was not very definite. Ballance's sign was not tried. There was slight distension and fullness in the

region of the umbilicus and lower abdomen. Nothing was felt in the pouch of Douglas, but there was a fullness anterior to the cervix. There was no history of stomach trouble, and the menstrual history was quite normal, the last period being one week previously. The urine, when tested in the side room, was found to reduce Fehling's solution, and a rough estimation gave a reading of 4 per cent. Owing to the urgency of the case this point was not further investigated. There was no blood, pus, or albumin present.

No definite diagnosis was made beyond internal hæmorrhage.

At operation, 11 P.M., a mid-line suprapubic incision was made, and the abdomen was found to be full of blood,

[1] Bailey, Hamilton: Brit. Jour. Surg., 1930, xvii., 417.
[2] Susman, M. P.: Ibid., 1927, xv., 47.

A rapid examination showed that uterus, tubes, and ovaries appeared to be normal. A fresh mid-line incision, above the umbilicus, showed that the hæmorrhage was due to a rupture of the spleen. The incision was carried in a transverse direction and the spleen was removed. The operation was one of considerable difficulty owing to adhesions of the great omentum around the organ. As much as possible of the blood and clots was removed from the abdomen, and the wound closed. An intravenous gum saline was given immediately afterwards.

The patient's pulse-rate continued to rise throughout the night and a blood transfusion was performed by the citrate method early next morning, with a temporary improvement in the condition. Up till this time the case was thought to be one of spontaneous rupture of the spleen, but when the patient was questioned more closely she said that a fortnight previously she had received a blow on the left side in the small of the back, just below the ribs. The blow brought her to her knees, and she spent a sleepless night with the pain, which also persisted through the next day. After that, however, she felt quite all right, and indeed went on foot to a skating rink with a friend and had no further trouble until the day of her admission to hospital.

The patient's condition remained the same throughout the day, but became worse during the following night, and a second blood transfusion was carried out in the early hours of the following morning, again producing a temporary improvement. This was not maintained, and the patient died at 6.30 P.M.

A post-mortem examination was made by Dr. H. A. Cookson, pathologist to the Sunderland Royal Infirmary, to whom I am indebted for the following description and photograph of the spleen.

All the organs, both in the chest and abdomen, were pale but healthy. There were no fractured ribs. The spleen, which was removed at operation, weighed 4½ oz. The large axis measured 4¼ in., and the transverse axis 3¼ in. There was a transverse tear 2 in. long on the convex surface. Apart from injury the organ showed no evidence of disease. A large hæmatoma had taken place under the capsule and this had ruptured. It is interesting to note that organisation of a portion of the hæmatoma had taken place.

I am indebted to Dr Hamilton Ross, honorary surgeon to the Sunderland Royal Infirmary, for permission to publish an account of this case.

A CASE OF INTRACRANIAL TUMOUR.

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AND
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PATHOLOGIST TO THE HOSPITAL.

THE patient, a single woman of 30, presented herself at the out-patient department of the Royal Northern Hospital on August 14th, 1930, and was seen by one of us. She complained that for the previous six weeks she had been suffering from headache, which was getting worse, and which had kept her in bed for ten days. The pain was described as "bursting" and was felt at the back of the head, a pain also radiating up the back of the neck. She gained temporary relief by rising from the recumbent to the erect position, but only very recently had she experienced the pain on waking in the morning. The back of the head was sensitive to pressure. There was weakness of the legs after an attack of headache. She had once lost consciousness.

A provisional diagnosis of hysteria had been made outside, and the general aspect of the woman certainly agreed with this suggestion. Routine examination of the nervous system revealed only two abnormal conditions, a myopic left eye with old choroido-retinitis, and a patellar clonus on the left side. Inquiry about the eye condition elicited the fact that an eye specialist had recognised it six years previously but had not made any further test and had not advised any general treatment. No stigmata of congenital syphilis were present. Both on general grounds and on the strength of the choroido-retinitis a Wassermann test was ordered, but unfortunately it was not carried out owing to her failure to attend.

A week later the patient was brought to the hospital in an ambulance and stated that the headache was worse; otherwise her condition seemed as before. A quarter of an hour later she suddenly became comatose and respiration ceased. It was therefore obvious that the respiratory centre had failed, the other medullary centres remaining, for the time being, unaffected. A provisional diagnosis of tumour in the posterior fossa was made. To prolong life an intratracheal catheter was passed and attached to an oxygen supply; the colour remained good and the heart continued to beat in a normal manner without any artificial respiration. It was considered advisable to obtain a small quantity of cerebro-spinal fluid for examination to exclude subarachnoid hæmorrhage. Therefore, at the risk of increasing the medullary pressure cone, a small quantity was withdrawn by lumbar puncture. The fluid was perfectly clear, so that the diagnosis of tumour remained. Surgical opinion was against any decompression operation.

Twelve hours after her collapse the patient died, the pulse gradually failing, and the temperature falling to 95°. The intratracheal oxygen was continued until death.

Post-mortem Examination.—The body was that of a healthy looking well-nourished female. The brain (weight 43 oz.) showed an area of softening in the right frontal lobe at the frontal pole, some two inches wide and extending to at least two and a half inches depth in the brain substance. The dura mater was adherent to the brain, and connected with it was a firm tough piece of yellowish tissue about half an inch in diameter; no line of demarcation between this tissue and the brain substance could be demonstrated. The other parts of the brain showed no abnormality, except that there was a small but definite pressure cone. Section showed the tissue to be a gumma.

The very small quantity of cerebro-spinal fluid withdrawn shortly before death yielded a strongly positive Wassermann reaction. The cells did not exceed one (lymphocyte) per c.cm.

COMMENTARY.

Gumma is a comparatively rare form of intracranial tumour. In Cushing's series of 1398 cases, syphiloma accounted for 13, or just under 1 per cent. Starr[1] collected 22 gummata in 600 intracranial tumours, or 3·67 per cent., only two of the patients being under 18 years of age. He therefore concluded that intracranial gummata were rare in childhood and never resulted from congenital syphilis. Hoppe agrees that they are practically never found in children. Clark found gumma in 6 per cent. of intracranial tumours. Tooth, on the other hand, found none in 258 cases of tumour. All authorities agree on the rarity of intracranial gumma in children and that the acquired infection is nearly always responsible.

In this case the tumour itself, being situated in a silent area, produced no signs or symptoms until six weeks before death, when presumably the onset of œdema and softening began to cause an increase of intracranial pressure. Death seven weeks after the first symptom is an unusually rapid course in intracranial tumour. The presence of increased pressure was suspected solely from the character of the headache, and gumma suggested itself on account of the old and quiescent choroido-retinitis.

The situation of the tumour conforms to what is usual—namely, that in its origin the gumma is generally superficial and usually at the convexity of the brain (Gowers). The tumour may start as an osteitis or periostitis of the skull, or may take origin in the meninges.

The Wassermann reaction in the cerebro-spinal fluid is not necessarily positive, as it was in the case described. In the case reported by D'Aunoy, Friedrichs, and Zoeller[2] the W.R. was negative in the cerebro-spinal fluid and positive in the blood. Seeing that gumma is due to localised infection of the meninges and not to an infection of the parenchyma

of the central nervous system, there is no reason to expect a positive reaction in the fluid. A coincident specific meningitis may, however, produce a positive reaction in the fluid by permitting leakage of the Wassermann substance from the meningeal vessels. As in all cases of tertiary syphilis, the blood Wassermann may be negative, so that a negative test in both blood and fluid is not an absolute bar to the diagnosis of intracranial gumma.

It is evident that no treatment could have saved this patient at the time that she first attended the hospital. But if the specific nature of the choroidoretinitis had been recognised six years previously appropriate treatment would probably have prevented a fatal result. It was admittedly hazardous to withdraw fluid by lumbar puncture, thereby inevitably increasing the pressure cone through the foramen magnum, but it was considered justifiable in the circumstances. Cisternal puncture was considered first but was regarded as impracticable in this case, as the cisterna magna would be compressed by the pushing down of the cerebellum and medulla, so that the needle might have injured the latter.

This case again illustrates that intratracheal oxygen is not only a substitute for artificial respiration but is also more efficient, and will keep the blood fully oxygenated as long as the circulation is maintained.

We are indebted to Dr. C. C. Beatty for permission to publish this case.

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MEDICAL SOCIETIES

HUNTERIAN SOCIETY.

AT a meeting of this Society held on March 2nd the chair was taken by Prof. A. W. SHEEN, the President, and the Hunterian Oration on

Surgical Aspects of Diverticulitis

was delivered by Mr. A. E. MORTIMER WOOLF. Diverticulitis, he said, was not unknown to John Hunter; the Hunterian collection contained a specimen originally labelled "colitis" but now relabelled "diverticulitis." The first real description of the disease had been given in 1849; early writers had held that diverticula of the large intestine were true herniæ through muscular gaps caused by dilated vessels. There were, however, objections to this view. If the condition were due to internal pressure—notably that of constipation—it would not be expected to occur more frequently in men than in women, as it actually did. There was something much more fundamental about the cause, and Mr. Woolf had therefore followed John Hunter in turning to comparative anatomy for its elucidation. Diverticulitis had been described in a series of pit-ponies (all but one Icelandic ponies) all showing emaciation and debility and a thickened intestine. The condition in the horse, however, occurred in the small intestine, though it was rare in the small intestine of man. Sections showed great hypertrophy and segmentation of the muscular coat, large vessels in the gap and the diverticulum coming through between the segments—the same picture as in man. Serial sections of one equine case had shown two diverticula, one of which had come right through the bowel and convoluted until it overlapped the second.

In the developing chick the muscle was seen to be laid down in segments with wide spaces between them. The muscle of the intestine was not therefore originally developed as a continuous sheet. The hypertrophy was clearly an important factor. Muscle hypertrophied only in response to a nervous stimulus, not as a result of hyperæmia. The dilated vessels were therefore the result and not the cause of hypertrophy. It seemed permissible to suggest that the essential fault in diverticulosis was a disturbance of the neuromuscular system of the intestine. Keith had shown in the ileo-cæcal valve of the rat cells which were neither muscle nor nerve, and had called them "nodal" in comparison with the neuromuscular mechanism which controlled the heart. In diverticulitis there seemed to be a neuromuscular dysfunction of the rhythmical contraction of the segments of the large intestine. Eventually, a little piece of mucous membrane was caught up, or even intussuscepted into the widened gap between the muscular bundles. This might be the origin of intussusception in the young child. The only point against this explanation was that diverticula might have perfect mucous linings, which seemed unlikely if the mucous membrane had been nipped and extruded. This opened up the possibility of congenital isolation of islands of hypoblast.

SYMPTOMS.

The initial symptoms were those of early dyspepsia such as that associated with disorder in any abdominal organ. They specially resembled the symptoms of cholecystitis—irregular dyspepsia, flatulence, and obesity. From the surgical aspect the symptoms depended entirely on complications due to the retention of fæcal material within the enlarged lumen. The first symptom might be a sudden catastrophe such as perforation. A common prodromal symptom was pain when the bladder was full caused by adhesion to the bladder. A fistula might be almost the first symptom; in one case three segments of a tapeworm had been passed per urethram. There was usually palpable thickening of the sigmoid. In the early stage thickening was due to hypertrophy of the muscle; in the late stage it was due to a true inflammation—the condition known as perisigmoiditis. The differential diagnosis from carcinoma might be exceedingly difficult. The general condition was not of much diagnostic value. The tumour of diverticulitis was larger, longer, and more variable than the small, hard, and craggy tumour of carcinoma. When obstruction had supervened, the diagnosis was even more difficult, but the two could be distinguished. In diverticulitis the obstruction was hardly ever absolute, never quite so urgent as in a malignant case; there was usually a long history of periodic or of febrile attacks and a leucocyte count might suggest inflammation. The treatment of diverticulitis was never urgent; the obstruction would subside with rest in bed, fomentations, and starvation. When in doubt, however, it was better to operate than to wait too long.

Abscess formation might occur anywhere where there were diverticula, but was usually in the sigmoid. If left alone the abscesses might perforate. Operation was difficult, as adhesions had to be separated. Sometimes an abscess would cause a fistula into vagina or bladder The result was always passage of fæces per urethram and never, for some unknown reason, of urine per rectum. Multiple abscesses might

be found; this was a very grave condition. Diverticula might become strangulated or intussuscepted.

DIAGNOSIS AND TREATMENT.

The great thing in diagnosis was to keep the disease in mind, though precise diagnosis was often impossible. No reliance should ever be placed on a barium meal, but an opaque enema was of real assistance. An emptying picture as well as a filling picture must be obtained, and in cases of doubt a series of pictures should be taken. The pre-diverticular stage (stage of hypertrophy) showed a spiky appearance of the fæcal mass and above that a loss of haustration, so that the fæces formed a solid column.

The best rule was to abstain from operation if possible. Only the surgical complications should be surgically treated. Resection involved a very great risk; anastomosis was difficult in the lower sigmoid and the work had to be done on damaged gut. If he must resect, the surgeon should do it in two stages. For obstruction the best operation was to attach the intestine to the skin and make a small longitudinal opening in it which would close naturally as the obstruction disappeared in a few days. If colostomy was afterwards essential the opening would have to be closed later. "Pauchet's operation" of patching the colon with a piece of small intestine had first been done by W. S. Fenwick at Charing Cross Hospital before the war.

DISCUSSION.

Sir CHARTERS SYMONDS congratulated the orator on his address.

Mr. J. P. LOCKHART-MUMMERY said that he did not think the ætiology of diverticulitis had ever been satisfactorily explained. The tempting explanation was pulsion herniæ, but the pressure within the intestine appeared to be the same as the pressure outside. The vast majority of the patients were fat; often they had been healthy and athletic in youth. Muscle tended to turn to fat in age and lack of exercise, and he was sure that there was a fatty degeneration of the circular fibres which allowed the mucosa to bulge between them. The vessels caused weak points where diverticula were likely to occur. The treatment was to leave it alone if possible, but if there must be an operation it should be colotomy. Wrapping omentum round the damaged portion of bowel was very satisfactory for early cases. Resection also might be suitable for cases of obstruction where there was dense fibrosis in a small area.

Dr. GRAHAM HODGSON showed radiograms illustrating the necessity for oblique as well as antero-posterior views. Two photographs on the same plate at intervals of ten seconds showed a double outline due to peristaltic wave; where there was fibrosis the double shadow was not seen. When the diverticula were homogeneously filled by the barium enema it meant that the douche could empty them and the prognosis was therefore better than when only small patches of bismuth were seen in the diverticula.

Dr. SCOTT WILLIAMSON said that the primary lesion was hypertrophy and not inflammation. There were two definite conditions behind it: a neuromuscular congenital disposition associated with fat deposition which had laid the segments further apart than normal, and secondarily a process of herniation of mucosa.

Mr. W. H. OGILVIE said that diverticulitis was one of the few diseases standing between surgeons and complete mechanisation; it defied standardisation; each case was a fresh problem, and the first operation was nearly always a life-saving measure. It was one of the few remaining conditions in which really heroic surgery was justified. The aseptic method of anastomosis was a very great technical advance.

Dr. CAMPBELL MCCLURE quoted two cases in which diverticulitis had been preceded for many years by obstinate sigmoid spasm, and suggested that the nervous spasm might have something to do with the production of hypertrophy.

Mr. C. P. G. WAKELEY described two small diverticula found in a human embryo of 19 mm.; this supported the congenital ætiology. The whole condition would often disappear if tension were relieved by opening an abscess.

The CHAIRMAN mentioned the use and abuse of the sigmoidoscope and Mr. WOOLF replied.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

AT the meeting of this Society at Manchester on Jan. 23rd the chair was vacated by Dr. J. W. BURNS (Liverpool) and Mr. W. W. KING (Sheffield) was installed as President. A paper on

Vaginal Hysterectomy

was read by Dr. S. B. HERD (Liverpool), who began by pointing out that little support for the operation was to be found in gynæcological text-books, some being frankly antagonistic. The present communication was based on a series of 50 cases. As a rule the vagina was prepared by hyperchlorite packs and douches for two days before operation. The cervix was closed by three or four silk sutures which also acted as tractors. The utero-vesical and Douglas's pouch were opened in the usual way. Early ligature and division of the utero-sacral ligaments was desirable to give greater mobility, after which it was easy to work up the sides and secure the uterine arteries. Dr. Herd had not found it necessary to bisect the uterus or remove fibroids piecemeal. The appendages could be removed with the uterus or dealt with separately where removal was advisable. All stumps were fixed to the vault with their cut surfaces projecting into the vagina after partial closure of the peritoneal cavity. In cases of prolapse, vaginal repair was combined with hysterectomy. The contra-indications were carcinoma of the body or cervix, inflamed appendages, fixation of the body or uterine enlargement out of proportion to the vagina including nulliparity. In the cases reported only six patients were under 40, the average age being 44 and the average stay in hospital after operation 17 days. Four were cases of carcinoma, and these did not do well. Of the remaining 46, 43 made excellent recoveries. There was one death from broncho-pneumonia, one case of hæmorrhage on the tenth day controlled by packing, and one case of pyelitis. The most noteworthy feature of the cases was the absence of shock and the rapidity of recovery.

The PRESIDENT, Mr. A. GOUGH, and Prof. MILES PHILLIPS spoke strongly in favour of the method, Prof. PHILLIPS remarking that no gynæcologist had the right to call himself a gynæcologist who did not choose this route in as many cases as possible.

The Ovary during Pregnancy.

Dr. R. NEWTON (Manchester) read a preliminary communication on the appearance of the ovary during pregnancy. In October, 1928 he said,

Prof. D. Dougal described small, rust-coloured areas on the surface of the ovaries as noted during Cæsarean section. Dr. Newton had looked for these since in a series of Cæsarean sections and had found them always present in both ovaries. He described the methods of fixing and staining employed and demonstrated the microscopical findings in several specimens he had obtained. These rust-coloured areas he found to consist of groups of decidua-like cells lying at varying depths in the cortex, but always with at least three or four layers of cells separating them from the surface. They were apparently in every respect similar to decidual cells. They were large, oval, with faintly granular protoplasm and a prominent nucleus, lying in a loose matrix, with fibrils running between the cells. The presence of glycogen was demonstrated by Best's carmine stain. Dr. Newton emphasised that he had not found any of these areas absolutely on the surface of the ovary, nor had he been able to find glands present in these decidual group of cells.

A number of cases and specimens were described or shown.

LIVERPOOL MEDICAL INSTITUTION.

AT a meeting of this Institution on Feb. 5th a paper on the

Early Diagnosis of Pregnancy

was read by Dr. M. M. DATNOW. After speaking of various investigators who had attempted to elaborate tests for the early diagnosis of pregnancy (Liepman, Abderhalden, and Fahraeus), he pointed out the great superiority of the method of Aschheim and Zondek, which gave 98 per cent. of accurate results. Moreover, the consideration on which this test was based might be a starting point for investigation of many sex problems. Apart from normal pregnancy, positive reactions were given by hydatidiform mole, chorion-epithelioma, ectopic gestation and, in a few cases, malignant disease.

Dr. T. N. A. JEFFCOATE said he agreed that the Aschheim-Zondek test was very reliable. The question of the origin of the hormones was very interesting, and of late some observers had tended to believe that the hormones found in the urine in pregnancy were derived from the placenta rather than the anterior pituitary. Dr. Jeffcoate had recently studied a case of pregnancy in which both ovaries had to be removed at the sixteenth week. There was no change in the amount of œstrin in the urine after operation, and this suggested that the placenta rather than the ovaries was the chief source of the œstrin excreted in the urine during pregnancy. The solution of the problem of the origin of prolan A and B was more difficult, since animal experiment was excluded by the fact that the urine of pregnant animals did not give the reaction. Prolan A was found in the urine of women after castration, at the menopause, and in some cases of carcinoma; the occurrence of this hormone in the urine in these conditions did not, however, affect the reliability of the test as used in the diagnosis of pregnancy, since it was present in much smaller quantities. If the investigator was given the clinical data as a guide it was possible with the Aschheim-Zondek test to be correct in the diagnosis of pregnancy in almost 100 per cent. of cases.

Dr. A. A. GEMMELL sounded a warning note against accepting the test as always accurate. In a very limited number of cases he had had two in which the test performed by the pregnancy diagnosis station at Edinburgh was incorrect. The test was not a test for pregnancy but for the presence of living chorion, and its reported result must be carefully considered in conjunction with the clinical findings.

Abnormalities of the Hyoid Arch.

Mr. T. GUTHRIE read a paper on Two Abnormalities of the Hyoid Arch. The first consisted in the presence, on both sides, of a complete articulated chain of bones, forming the second visceral arch, and corresponding to the condition found in many of the lower animals, such as the dog. The condition was evidently atavistic, and was interesting from a morphological point of view. It caused no disability, but radiograms showing it had occasionally been misinterpreted. The second abnormality was an excessive development of the styloid process, the lower end of which sometimes projected under the mucous membrane of the lateral wall of the pharynx, in the region of the lower pole of the tonsil, and caused discomfort on swallowing and talking. Complete relief in these cases followed removal of a sufficient length of the bone with or without the corresponding tonsil. This abnormality was probably much more common than the first and unrelated to it. It appeared to be due not to atavism, but simply to excessive ossification of the stylo-hyoid ligament. Unless borne in mind and looked for, the condition was apt to be missed, and the patients' complaints to be regarded as of nervous origin.

Output of the Diseased Heart.

Dr. ISAAC HARRIS read a paper on Cardiac Output and Oxygen Utilisation in Heart Disease. Data were collected, he said, from different types of heart cases in regard to consumption of oxygen, output of CO_2, the patient's reaction to exercise, oxygen requirement, oxygen debt, CO_2 and oxygen in venous blood, cardiac output, heart-rate, and number of respirations. Cardiac output was determined by the CO_2 method. Determinations were undertaken under resting conditions and after standard exercise. The investigation showed that under resting conditions oxygen consumption, with a few exceptions, was normal. The percentage of oxygen utilisation, with exceptions, was normal too. So also the cardiac output. Exceptional cases which show an abnormally small output gave an abnormally high percentage of utilisation, the two conditions standing in inverse ratio to each other. The size of cardiac output broadly stood in some relation to the amount of oxygen consumption, but a case in which the cardiac output was large and oxygen consumption moderate gave a low hæmoglobin percentage, the large output evidently compensating for a poor carrying capacity of oxygen of the blood. The cardiac output was increased to a much smaller extent in heart cases after a standard exercise in comparison with normal cases; whilst the percentage of oxygen utilisation had greatly increased in the diseased heart after exercise, the percentage of utilisation remained the same in the normal heart under resting and working conditions. Thus oxygen utilisation and output stood in inverse ratio to each other. This constituted a very important factor in estimating cardiac reserve power. Further, the oxygen consumption as the result of work in heart cases was greatly increased above normal, and the time before the oxygen consumption became normal again was greatly prolonged. The CO_2 content of the blood in heart cases under resting conditions was lower than normal. This was

contrasted with oxygen saturation, which was practically normal in all these cases. Stroke volume increased after exercise in the diseased heart to a less extent than in the normal; in an advanced case of heart disease it did not increase at all. The reaction of stroke volume to exercise was a definite measurement of cardiac reserve power. The diseased heart increased its minute volume by increase of number of beats, the normal heart by increasing the size of the single stroke volume. The importance of this method was so great, said Dr. Harris, that the Liverpool Heart Hospital had created a special department for routine examination of suitable cases.

MANCHESTER MEDICAL SOCIETY.

A MEETING of this Society on Feb. 4th, with Mr. J. HOWSON RAY, the President, in the chair, was devoted to the

Treatment of Toxic Goitre.

Dr. J. CRIGHTON BRAMWELL, discussing the relative merits of surgical and non-surgical methods of treatment in primary and secondary Graves's disease, concluded that at present surgical treatment was the method of choice in the more advanced cases, but thought that in the future earlier diagnosis would render most cases of primary Graves's disease curable by medical means.

Mr. JOHN MORLEY based his remarks on a series of 120 cases of primary exophthalmic goitre and 72 cases of toxic adenoma on which he had operated. The mortality in the former group was 5 per cent. and in the latter group 6·9 per cent. The tendency in and around Manchester to refer only the more severe cases to the surgeon inevitably involved a somewhat higher mortality than was found in surgical centres where all cases, including the mildest, were treated by operation. The cause of death in most cases was myocardial weakness. The end-results of operation had been assessed by a questionaire on increase in weight since operation, continuance of palpitation, and ability to resume normal work. This was supplemented by personal interview when possible. The results of this investigation were tabulated as follows:—

	Very Good.	Good.	Moderate.	Poor.
Primary exophthalmic goitre (97 cases)	60	24	6	7
Toxic adenoma (54 cases) ..	38	13	2	1

While there was general agreement that all cases of toxic adenoma or secondary toxic goitre should be operated on without undue delay, there was still much difference of opinion about the indications for X ray treatment or operation in primary exophthalmic goitre. Mr. Morley believed that X ray treatment gave the best results in the less severe cases with small goitres. In such cases he favoured a course of X ray treatment lasting three months, rigidly controlled by the effect on weight, pulse-rate, and basal metabolic rate. If at the end of this test period there was no really striking improvement, he thought it wiser to advise operation at once, in order to relieve the strain on the heart muscle. A third of his cases of primary exophthalmic goitre had been treated without success by X rays before they came to operation. One patient who had undergone intensive X ray treatment developed tetany after operation, but it was found on going into her history again that she had noticed similar attacks of tetany for four months before operation. This suggested that the X rays had damaged the parathyroids. The effect of iodine medication was usually transient, and often the early favourable effect of iodine on the pulse-rate could not be repeated. Mr. Morley pleaded that iodine should be reserved as a powerful safeguard for the patient in the fortnight or so before operation. An adequate period of pre-operative rest, with the closest coöperation with the physician in the treatment of the heart by digitalis, contributed largely to the safety of operation. Though general anæsthesia by gas and oxygen was safe in an averag ecase, Mr. Morley expressed a growing preference for local anæsthesia in the more severe cases, and regarded it as especially necessary in cases with auricular fibrillation. While operation was not the last word in the treatment of exophthalmic goitre, in the present state of our knowledge it must be regarded as the most rapid and most efficient form of treatment available.

Dr. E. D. GRAY reviewed in detail the results of medium voltage X ray therapy in 99 cases of toxic goitre treated at the Manchester Royal Infirmary during the year 1928. In his opinion, X ray therapy was a valuable form of treatment in cases of exophthalmic goitre without visceral complications and a four months' trial was indicated, provided the patient was able to attend regularly and had a reasonably comfortable home. If careful records of the symptoms, pulse-rate, and weight were kept, it was usually possible at the end of this period to decide whether X ray treatment would be successful in a particular case. A perfect functional result was obtained in 50 per cent. of the cases of exophthalmic goitre in this series and a further 33 per cent. were markedly improved. X ray therapy had also something to offer in cases of toxic adenoma, for with a larger course of treatment, good palliative results were frequently obtained. Until it were proved that patients suffering from this type of toxic goitre inevitably developed cardiovascular damage in the course of time, X ray treatment could be recommended if operation was undesirable.

ST. LUKE'S HOSPITAL, BRADFORD.—A £10,000 scheme for the provision of operating theatres at this hospital has been adopted by the Bradford corporation health committee. The proposed block is to contain two operating theatres, each with appropriate accommodation for patients, surgeons, and theatre staff.

ARUNDEL COTTAGE HOSPITAL.—A new hospital is to be erected on the Chichester-road at Arundel in place of the present building which has been found too small for present needs. At the annual meeting of the governors on Feb. 4th, the acceptance of a tender of £9475 was ratified; and a special appeal is to be launched for £3000. Including a gift of £5000 from Miss Kathleen Mitchell, the first appeal brought in the sum of £7145.

DONATIONS AND BEQUESTS.—By the will of the late Mr. F. L. Lucas, of London and Ascot, the Hospital for Sick Children, Great Ormond-street, London, will receive £1000 and a quantity of jewellery: University College Hospital £500, and the London Hospital, the Metropolitan Hospital Sunday Fund, and King George's Hospital, Windsor, £250 each. Several medical institutions will receive smaller sums under the same will.

CHORLEY HOSPITAL.—The income of Chorley Hospital is well maintained. The total income was £4007 compared with £3871 for the previous year and the expenditure £3936 compared with £3466. This satisfactory state of affairs, in a large measure, is due to the success of the workpeople's hospital contributory scheme, the amount handed over being £1800. Motor accident cases spent in hospital 942 days, the cost of their maintenance being £329. Of this latter amount only ten guineas was recovered.

REVIEWS AND NOTICES OF BOOKS

Lehrbuch der Protozoenkunde.

Eine Darstellung der Naturgeschichte der Protozoen mit besonderer Berücksichtigung der parasitischen und pathogenen Formen. Founded by FRANZ DOFLEIN. Fifth edition. Revised by Prof. Dr. EDUARD REICHENOW, Departmental Director at the Institute for Marine and Tropical Diseases, Hamburg. Part II. *Spezielle Naturgeschichte der Protozoen.* Second half: *Sporozoa, Ciliata and Suctoria.* Jena: Gustav Fischer. With 378 text-figures. Pp. 398. RM.21.

THIS completes the fifth edition of Doflein's text-book edited and brought up to date by Dr. Reichenow, two previous parts having already been noticed. In the final part the editor continues his consideration of the sporozoa and deals ably with the parasites of malaria and the piroplasmata which are of special interest to medical men and veterinarians. From these he passes on to the cnidosporidia which he regards in the orthodox, though perhaps not quite logical, manner as a subclass of the sporozoa. The final section deals with the ciliophora. At the end is a good index, together with the title page, foreword, and table of contents for binding in one large volume, much the size of the fourth edition published in 1916.

The book is a valuable contribution to the literature of protozoology, and maintains its previous standard in the excellence and number of illustrations. Its character has changed to some extent, for greater attention is now paid to parasitic protozoa, and on this account it will make a greater appeal to parasitologists. The free-living protozoa have however not been neglected, and the book can be recommended thoroughly to everyone who wishes to have a clear and timely account of the protozoa. Its value as a book of reference is enhanced by a full bibliography.

Scalpel, Sword and Stretcher.

By Colonel ROBERT J. BLACKHAM, C.B., C.M.G., C.I.E., D.S.O. London: Sampson Low, Marston, and Co., Ltd. 1931. Pp. 340. 12*s.* 6*d.*

THIS is a book which from its sheer simplicity defies criticism. Presumably the author has kept a diary for some 40 years of a busy life in which he worked hard, played also, and saw many things under many circumstances; the work is not put into diary form, but only by daily note-taking would it have been possible for anyone to recapitulate, more or less in order, so many things important and unimportant, while the fact that the events recorded are put down next to each other with little attempt at correlation makes the appearance of a diary still closer. The notes cover the period between the entrance of the author into the medical profession on St. Patrick's Day, 1883, and the date in 1920 when he was placed on half-pay; but it may be remarked that Colonel Blackham did not consider that life was closed when his army service was necessarily ended, for he immediately decided to try his luck at the Bar and was called some three years later.

The early chapters dealing with the Ulster counties and the Dublin city of the 'eighties describe manners and happenings that might be taken from the pages of Lever, and if Lever is scorned by real Irishmen as a depictor of Irish life and manners it is a fact that when real Irishmen write of Irish modes and manners their pages are generally reminiscent of Lever. In 1895 Dr. Blackham, as he had just become, obtained a commission by competition in the R.A.M.C., not then elevated to its position as a Royal Corps, and we have many chatty and intimate notes on men and things that interested the new soldier-doctor. The description of Netley at this time will evoke many amusing reminiscences from Colonel Blackham's contemporaries and immediate seniors. After three years' service at Aldershot he received orders to embark for India, and all the middle of the book, in fact until we arrive at the date of the Great War, is concerned with work and play in the Indian Empire. These chapters are punctuated with quotations from Kipling and are imbued with the same patriotic convictions. There are many stories, some good, some trivial, some new, and some old, and there are many pictures most of which serve their proper purpose of illustrating the text in places where illustration is useful.

Some of the most interesting passages in the book, such as the chapter entitled The White Cross and the Red, describe the work of the St. John Ambulance functioning as the National Red Cross of India. To the organisation of ambulance work Colonel Blackham devoted so much attention that one of his chiefs made official complaint on the matter. Before the outbreak of war he had been appointed paid secretary of the Association for a certain term; and it need hardly be said that when the war did break out the ambulance peace organisation became the Red Cross for India. The task of organising the developments was a whole-time job, as anyone must appreciate on reading the details of what was done, and until July, 1915, Colonel Blackham, though employed exclusively on Red Cross duties, must have had his hands entirely full. When in 1915 he went to the front he had completed seven years' service with the St. John Ambulance in India with really fruitful results.

The author describes his war experience in the last 100 pages of the book, and from his brief and picturesque notes we get a good picture of the miseries, hardships, and unsuppressible good humour which marked the conduct of the struggle on the British Western front. The mixture of the entirely trivial and anecdotal with reports of terrible happenings makes a very readable compost, and the author may be congratulated both on a successful professional career and on his readable account of its steps.

Cancer and Scientific Research.

By BARBARA HOLMES, Ph.D., Biochemical Laboratory, Cambridge. With a preface by Prof. F. G. HOPKINS, President of the Royal Society. Sheldon Books of Popular Science, edited by Joseph and Dorothy Needham. London: Sheldon Press. 1931. Pp. 160. 3*s.* 6*d.*

THE object of this little book is to give the intelligent layman an understanding of the investigations which have been pursued and are being pursued into the problem of cancer. As Sir Gowland Hopkins says in his preface, "studies of cancer prove to be studies of the working of nature, though in circumstances which seem to display nature as cruel. All scientific progress is showing, however, that Man can control Nature and bend her to his will. In the following pages is described the united effort to obtain knowledge which will ultimately lead to such control in the case of cancer." The hopes aroused

by this introduction are not disappointed on reading the book. In a clear and interesting manner it gives a complete and critical survey of the cancer problem, of the methods by which it has been attacked, and of the progress which has been made. To present such a complex and extensive problem concisely in simple language and to separate the grain from the over-abundant chaff is no easy task, and the author is to be congratulated on her complete success. There is only one point on which most students of cancer will be inclined to disagree with the author—namely, the acceptance of the views of Maud Slye on the importance of heredity in the incidence of cancer. There is no doubt that heredity does play a part in the incidence of cancer, but the extreme views held by Miss Slye on the basis of her breeding experiments are at present not generally shared by other workers in this field. This is an aspect of the cancer problem which is obviously of special interest to the general reader and it would have been better to take note of the criticisms to which Miss Slye's work has been subjected.

We recommend this excellent book to our readers and to the general public.

How to Keep Healthy in the Tropics.

By J. N. DUGDALE, M.B., Ch.B. Edin., formerly Consulting Physician and Surgeon, Liuyang Red Cross Hospital, Hunan, China; Visiting Medical Officer, Bukit Pulai and Associated Estates, Johore, Malaya. Singapore: Malaya Publishing House, Ltd. 1930. Pp. 162. 5s.

Dr. Dugdale is not the first who has attempted to describe in simple and popular language the dangers of tropical diseases and the best means of avoiding them. It is difficult to do this without falling into a morass of technicalities which will repel the layman, for whom the information is intended; but Dr. Dugdale has succeeded better than most of his predecessors. The 38 lectures which comprise this book are eminently practical; they include hints for the new-comer; cautions in the dangers of unfiltered water, snakes, and snake-bite; and notes on the causes of indigestion, the importance of vitamins, and the prevention of tuberculosis in the tropics. Many precautions, which appear to the medical eye almost too obvious to mention, will be welcomed by the readers of this book. One or two mistakes have crept into the text. The mosquito-malaria problem was not solved in 1895 (p. 83), nor is it generally conceded that yellow fever is caused by a leptospira (p. 93).

The Vertebræ,

Roentgenologically Considered, including a Study of Industrial Accident Cases. Annals of Roentgenology, Vol. VIII. By A. WELLINGTON GEORGE, M.D., Sc.D., F.A.C.R.; and RALPH DAVIS LEONARD, A.B., M.D. New York: Paul B. Hoeber (Inc.). Pp. 286. $10.

THIS is one of an admirable series of manuals, written by experts, under the general editorship of Dr. James T. Case. The joint authors have already contributed "The Pathological Gall-bladder" to the series. Like its predecessors, the book is beautifully turned out, and the illustrations are of the highest quality. They show well the detail even of such difficult regions as the lower lumbar vertebræ and the sacro-iliac synchondrosis. The general editor is to be congratulated upon his choice of collaborators for this important branch of radiology. Industrial injuries of the spine are among the most puzzling of these that are continually before the courts under the Workman's Compensation Acts. It is largely with these cases in view that the book has been written. The radiographic evidence is often the deciding factor in any case, and in no branch of radiology is interpretation more difficult. Variations from the normal are so common and so misleading that mistakes are almost impossible to avoid.

The table of contents gives a good idea of the systematic and thorough manner in which the authors have done their work. Part I. deals with the subject as a whole, and points out the changes that result from age, posture, and occupation. This is followed by an account of congenital abnormalities, fractures, and diseases. Part II. occupies two-thirds of the volume and is devoted to a detailed study of each section of the spine, with special emphasis on that most important and difficult bone, the fifth lumbar vertebra. Special attention is given to the differential diagnosis of the various possible causes of lower back pain, and both the letterpress and the illustrative cases are of the first value. In view of the fact that so many spinal injuries find their way into the law courts, the appendix on medico-legal expert testimony is helpful. In a few pages the authors give common-sense advice from long experience and, if acted upon, it should save the witness from some of the traps into which the inexperienced are liable to fall.

The authors have succeeded in producing a book which is likely to be the classic book of reference on spinal conditions. It is trustworthy and adequate in every respect.

The Nature of Living Matter.

By LANCELOT HOGBEN. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1930. Pp. 316. 15s.

Prof. Hogben was the protagonist for the mechanistic outlook in the symposium on the nature of life held by the British Association in South Africa in 1929. He here expands his contribution and, with accomplished pen, which has made his book longer than it need have been, argues enthusiastically against the methods of interpretation represented in the main by Haldane, Smuts, and Eddington. He really settles the case in favour of his thesis by ruling that nothing can be scientific knowledge which cannot be expressed in mechanistic terms, and that biology is not concerned with anything but science. He divides knowledge into two classes: "public" knowledge which can be expressed in precise and definite terms and is communicable from one person to another, and "private" knowledge which has no clear language for its formulation and so cannot be passed directly from one mind to another. Science takes notice only of "public" knowledge and therefore can have nothing to do with, e.g., the experiences of love or religion which certainly cannot be precisely stated or communicated but which form, as Eddington would say, some of the most real facts of life which it is impossible to exclude from any attempt at explanation. The argument is clear and as far as it goes convincing, though obviously it will have no influence on opponents; they start from quite different premises as to the content of living matter if indeed they admit that life exists in anything but organisms. We wonder, by the way, whether Sir Charles Sherrington would agree (p. 308) that his public values in "The Integrative Action of the Nervous System" are really so different from the private values which emerge in "The Assaying of Brabantius."

THE LANCET.

LONDON: SATURDAY, MARCH 7, 1931.

THE TESTING OF DRUGS.

FIVE years ago pharmacological laboratories were opened under the direction of Dr. J. H. BURN at the house of the Pharmaceutical Society of Great Britain in Bloomsbury-square, London, with the three-fold aim of standardising such medicinal substances as cannot be adequately tested by chemical means, of prosecuting research work upon biological standardisation, and of training pharmacists in pharmacological methods of assay. The fifth annual report, issued to-day, epitomises with becoming modesty the work of these laboratories during 1930, and affords substantial evidence that the Pharmaceutical Society is keeping pace with recent advances and changes in the treatment of disease. It affords, too, a practical proof, if proof were needed, of the desirability of close contact between doctor and pharmacist at a centre for the testing of commercial products as to strength, purity, and therapeutic activity.

The need for such an institution will be apparent to all. The progress of endocrine therapy from speculative theory to concrete clinical application, the legitimate claims of vitamins as therapeutic agents, and the establishment of the biological assay of certain potent medicaments place a new responsibility upon the pharmacist, who can no longer content himself with the proverbial dispensing of pills and potions. The physician demands drugs of clearly defined strength, quality, and potency, a claim recognised by the legislature when it introduced the Therapeutic Substances Act (1925) to prescribe (as occasion should arise) such stable standards of activity as are requisite for accuracy and safety in therapeutics. The pharmacologist, once he has produced and investigated a new therapeutic entity, cannot stop in his stride to devote his time to routine testing and standardisation. In the past, notably in connexion with the official galenicals, the onus of this duty has been placed upon the pharmacist by national pharmacopœias, and it is certain that in the future this practice will be continued and extended. Chemical standardisation of drugs, although desirable from the point of view of accuracy, is not always feasible, and the adoption of a biological method is essential in an increasing number of instances where the activity of a drug can only be controlled and regulated by defined physiological tests. Adrenalin, pituitary extract, and insulin are three outstanding examples of the change whereby the erstwhile prerogative of the medical research laboratory has been handed over to the skilled pharmacist to use on a larger scale in the world of commercial production. Progress, however, does not consist solely in the discovery of the new, but equally in the perfection of the old, and in the pharmacological field there is need and room for research in connexion with galenicals which have become commonplace through daily use. The past work of the Pharmaceutical Society's laboratories amply confirm this. Generations of medical students and midwives were taught that the official liquid extract of ergot being oxytocic should rarely be used before the completion of the third stage of labour owing to the risk of inducing tonic uterine contraction. Biological assay cast doubt upon this teaching, but it remained for Dr. BURN, in conjunction with Mr. ALECK BOURNE, of Queen Charlotte's Hospital, to settle all controversy. These workers proved conclusively that the pharmacopœial extract does not contain the specific alkaloid of ergot, and depends upon the presence of tyramine and histamine for any action it possesses. The tendency in treatment as in diagnosis is towards precision. In dealing with potent drugs the requisite precision is attainable only where accurately standardised preparations are used. In the case of the inorganic salts, most of the synthetic organic compounds, and those vegetable or animal products from which the active principle can be readily isolated, standardisation is relatively simple. It is otherwise where the active principles are unknown or unobtainable in a state of chemical purity, and here the availability of physiological standardisation is of prime importance. The U.S. Pharmacopœia has led the way in prescribing certain criteria in a few instances. In this country the Therapeutic Substances Act and the work of the International Conference on Biological Standards have paved the way for the new British Pharmacopœia. Uniformity of potency and dosage must have respect to a given standard, but this can only be put upon a scientific basis by international definition of the basic unit, as has been done by the Geneva Conference in the case of pituitary extract. Where no standard has been fixed, or where there is no general consensus of opinion as to the suitability of a given standard, it is necessary to have some centre provided with such staff and equipment as can produce satisfactory tests for assay and which is at the same time in a position to postulate a reasonable average of potency to which preparations of variable activity should conform. It seems to us that the Pharmaceutical Society, by means of its pharmacological laboratories, has gone a long way to meet these requirements and to bring nearer the cognate arts of medicine and pharmacy. It may be recalled with complacency that just 100 years ago a correspondent signing himself "Pharmacopolus" proposed in our columns the foundation of a pharmaceutical society to include both doctors and pharmacists.

The report before us deals with the research studies of its two departments during the past year, and in an appendix there is a list of publications, 14 in all, upon which the report is largely based. In the pharmacological department the stability of the tinctures of digitalis, strophanthus, and squill, of infusion of digitalis B.P., and of the

salts of ergotoxine and ergotamine has been studied. While no deterioration was detected in the tinctures of strophanthus and squill, the tincture of digitalis steadily deteriorated until at the end of 18 months only two-thirds of the original activity remained. Interesting results were obtained with the B.P. infusion of digitalis. Although this preparation decomposed within a few days the active principle remains, and if decomposition be prevented by the addition of chloroform or thymol the potency is unchanged after three weeks. Estimations of percolates of different samples of ergot indicate that extraction of the specific alkaloid is slow, and the preparation of a liquid extract of given strength requires careful adjustment of the percolation process. Ergotoxine ethanesulphonate was found to be relatively stable over a period of two years, but samples of ergotoxine phosphate and ergotamine tartrate deteriorated markedly. On the more strictly pharmacological side investigations were made into the action upon the uterus of anæsthetics and other drugs used in labour, the pharmacological actions of tyramine, and the toxicity of commercial samples of mercurochrome. In the last study astonishing differences were discovered; the most toxic preparation, it is stated, was 37 mg. per kg., the least toxic 140 mg. per kg. These figures indicate, Dr. BURN remarks, that a doctor might buy a preparation nearly four times as toxic as that previously used without knowing the difference.

From the nutrition department of the laboratories it is recorded that a standard for vitamin D similar to that of the Pharmaceutical Society has been adopted by the Medical Research Council. It is pointed out that irradiated ergosterol must be kept in an ice-chest to prevent loss of potency. A brief outline is given of the methods whereby the stability of the standard for vitamin D was investigated—viz.: (1) the estimation of the curative effect of vitamin D on the epiphyseal line in experimentally rachitic rats; and (2) a prophylactic test. The ratio of the percentage of ash to the percentage of organic matter exclusive of fat (conveniently known as the A/R ratio) was calculated for each bone examined. Some progress has been made in the laboratories in the determination of vitamin A, a provisional "standard" cod-liver oil being obtained whereby the relative potency of other samples may be tested and expressed as a percentage of the potency of the standard. Not the least instructive item in this report is the statistical account of the samples tested during the year, for which fees had been paid. Of 142 samples dealt with by the pharmacological department, 47 comprised digitalis, 35 pituitary extract, 28 ergot, and 13 squill. In the nutritional department, the 122 samples examined included 70 tests for vitamin D and 35 for vitamin A.

The possibilities of such laboratories as these are great. To the manufacturer they provide a neutral skilled opinion as to the efficacy of his products. The medical profession, remembering that the General Medical Council, the Medical Research Council, and the British Medical Association approved of the establishment of the laboratories, may expect with confidence that preparations carrying the Pharmaceutical Society's certificate will conform to certain standards of potency, the limits of which should become narrower as experience matures.

THE PANEL PATIENT AT HOSPITAL.

AT a recent meeting of the Scottish Branch of the British Hospitals Association held in Glasgow, Mr. NIVEN MCNICOLL, of the Scottish Department of Health, alluded to the difficulties felt by insurance practitioners in obtaining information about the treatment of patients whom they had referred to hospital. It had, he said, been alleged on the part of hospital authorities that the insured patient is not infrequently dumped on the hospital with a panel practitioner's card and a line scribbled on the back, or with even scanter courtesy. The hospital felt that it was entitled to a note from the practitioner, stating something about the case and why it was referred to hospital. The panel practitioner on the other hand was apt to complain that after referring a patient to hospital it was the last he heard of the case. It was to deal with this situation that National Health Insurance form M.R. had been drafted for the use of panel and hospital to record information for their mutual benefit. Mr. MCNICOLL added that a regulation would be issued shortly by his department, making it an obligation upon every insurance practitioner, under his terms of service, when he sent a patient to hospital to fill in form M.R. stating the nature of the illness and for what purpose the patient was being referred. In return the department hopes to arrange for the hospital to report to the practitioner on what has been done in the way of diagnosis and treatment. It is understood that some of the voluntary hospitals in Scotland view the proposed form with disfavour. Hospitals, it was argued at the meeting, should be chary in putting down information on such a form when they do not know whether it is treated as confidential or not. As a number of hospital boards were still considering their attitude to the scheme no decision was reached at the meeting.

It certainly seems as though Scotland has stolen a march on insurance medical practice in England by getting this measure of reciprocity, although even here there are indications of a better understanding between the voluntary hospitals and the insurance service. At present it may be broadly stated that the general practitioner service gets no reports from hospitals. Some members of hospital staffs actually dislike sending any report of insured persons who have been under their care in hospital, although they are willing to give their personal opinion of the same patients when sent to them with a personal letter from the practitioner. As a matter of fact the record envelope often does contain a specialist's opinion. It is perhaps hardly to be expected that the furnishing of a report by the hospital authority

can be made a definite condition on a hospital which does not accept any governmental grant. So long as this is the case the panel service must depend on the courtesy and enthusiasm of certain members of hospital staffs, than which nothing could be more exemplary; but some general understanding would be a distinct step forward in linking up the hospitals with the national insurance system. Even in Scotland the arrangement has come with a certain shock of novelty and has evoked some resentment on the part of hospital staffs and managements. The latter no doubt fear the expense and trouble of the additional clerical work involved, although the mere cost may well be offset by a saving of unnecessary references to hospital and of unnecessary treatment in hospital. It is in fact the feeling of the Scottish department that when the procedure is well established it may result in the more frequent treatment of the insured person by the practitioner instead of at the out-patient department of the hospital.

How far arrangements of this kind have already been made locally and informally it would not be easy to determine. Some time ago the Paddington Medical Society, following a lead given by the London Public Medical Service, designed a leaflet for the use of panel practitioners when referring patients to hospitals. It was thought that the introduction of such a leaflet would tend to encourage practitioners who had not been in the habit of sending a note or letter to the hospital with their patients to do so in future; that it would save the time of the consultant in replying, and particularly that it might result in patients being referred back at once to their insurance practitioners when the need for hospital treatment no longer existed, and in this way lessen the congestion of the out-patient department. The Paddington form resembles a sheet of note-paper and is far less forbidding than the Scottish form, which is formidable in size and appearance.

MUSCLE EXTRACTS IN CIRCULATORY DISORDERS.

MUCH has been written on muscle extracts since L. HABERLANDT in 1929 ascribed remarkable properties to one obtained from the heart. HABERLANDT, it may be recalled, isolated the sinus of the frog's heart, macerated it in Ringer's solution, and found that the solution then showed the power to augment the contractions of the frog's ventricle. From this he concluded that there was in the sinus node a chemical hormone specific for the heart, which he called a "heart hormone."[1] His experiments were soon confirmed, but it was noted that a similar action could be obtained by using the muscle of the ventricle itself, and later it was found that the same was true of other tissues of different origin. It has now been shown, indeed, that extracts from almost all body tissues will stimulate the frog's heart; and that even the urine in cases of heart disease has some activity of this kind. G. ZUELZER has prepared an extract from the liver, named eutonon, which has claims to be regarded as a cardiac "tonic,"[2] and there are numerous other tissue extracts in use, such as angioxyl (from the pancreas), myoston (from muscle), kallikrein (from urine),[3] and lately lacarnol (from striped muscle).

Similar claims are made for these preparations as for the original heart preparation (hormocardiol) of HABERLANDT; in general they are held to increase the rate and strength of the pulse, to dilate vessels, especially the coronary arteries, and to restore a regular rhythm in experimental auricular fibrillation. Needless to say, such properties would be very valuable in clinical practice, and it is now possible to review the results obtained in a fairly large series of cases, mostly in continental clinics. The extracts have been employed mainly for angina pectoris, endarteritis obliterans, cardiac failure, and high blood pressure. Some preparations at least seem to be inactive therapeutically and such action as others possess is apparently not limited to one muscle or even one tissue alone. In angina pectoris numerous favourable reports have been published, and a direct antispasmodic action is claimed by some workers. E. K. FREY[4] in 1929 reported good effects in cases of coronary sclerosis and also in high blood pressure from a "circulation" hormone present in urine, blood, pancreatic tissue, and the spleen. B. BUCHHOLZ,[5] using lacarnol, treated 11 patients with angina pectoris, of whom seven were entirely relieved of their attacks, two were improved, and two were unchanged. In two an alteration in the electrocardiogram was noted pointing to improved conduction from auricle to ventricle. R. SINGER[6] treated 171 patients suffering from angina pectoris, hypertension, intermittent claudication, and vascular spasm with different circulation hormone preparations, and found that lacarnol, hormocardiol, and eutonon seemed to be the most active. The results were especially good in angina pectoris. J. S. SCHWARZMANN[7] and others also report marked improvement in angina pectoris after the use of muscle extract.

The preparations appear to be most efficacious when given subcutaneously, but they can also be given by mouth; they are for the most part protein-free so that no shock reaction should result—though R. SCHMIDT[8] states that most of the benefit is due to a non-specific protein therapy and not to any hormonic action. Probably some chemical substance is present in the extracts which is capable of dilating arterioles and increasing the heart's action, possibly by improving the blood flow through the coronary arteries. Definite improvement has thus been recorded in cases of endarteritis and gangrene, and recently five cases of thromboangiitis obliterans were shown by M. SCHWARTZMAN at the Clinical Section of the Royal Society

[1] Das Herzhormon, Jena, 1930.

[2] See THE LANCET, 1930, ii., 1203.
[3] Ibid., p. 601.
[4] Münch. Med. Woch., 1929, lxxvi., 1951.
[5] Deut. Med. Woch, 1931, lvii., 188.
[6] Wien. Klin. Woch., 1931, xliv., 39.
[7] Münch. Med. Woch., 1930, lxxvii., 439 and 2224
[8] Ibid., p. 440.

of Medicine, all of which had improved under treatment with muscle extract. This substance has not been certainly identified, but it is clearly not histamine: adenosin has a dilator action upon the coronary arteries and may well be one of the substances concerned. Its use in treatment is still under trial. The bulk of the evidence at present available suggests that some non-specific chemical substances, present in many animal tissues and possibly containing adenosin, is capable of acting beneficially upon the heart and blood-vessels and may be of real value in cases of vascular spasm, coronary disease, angina pectoris, and possibly some other cardiovascular disorders. Further reports upon the therapeutic uses of the extracts will be awaited with interest.

ANNOTATIONS

SCIENTIFIC STAFFS.

In 1927 the British Science Guild appointed a committee to inquire into the functions of the scientific and professional staffs in the public services and industry from the point of view of efficient administration and national development. This committee, of which Sir Richard Redmayne acted as chairman and on which medical science was represented by Sir Arthur Newsholme, has now issued its report.[1] The position of the scientific expert is relatively new and has arisen from necessity, owing to the complex nature of problems now present in both business and administration, and it is reasonable to suppose that it has not yet been stabilised. The committee point out that:

> It is essential that all proposals and schemes shall receive adequate consideration from every point of view. This can only be obtained if suitable provision is made for the proper presentation of the various technical, financial, and other considerations involved in every problem in such a manner that those ultimately responsible for making decisions may be put in a position to weigh the several considerations in their bearing upon questions of general policy.

This is the position of a judge who is hearing a complicated case, and it can only be secured if the various experts are able to give their views, and so much of their reasons for holding such views as they can make intelligible to the final arbiters. It is evident to the committee that this desirable state of affairs is far from being realised in either State or industrial services. They refer to the stupid and groundless views which prevail that work of a scientific and technical kind is inferior to that of an administrative kind. That such views do prevail will be generally admitted. They rest in the main on the dislike of the average Briton for precise knowledge of any kind as a guide to action and on the belief that what is true in the laboratory is not necessarily true outside it. Hence the scientific expert is often kept in his place, which is often to furnish results of routine testing, to explain and excuse the delicts of branches not under his control, and to draft reports which will be edited by his administrative superiors before they reach the directorate. The committee's remark that "an officer should supervise only work which he is competent to judge and concerning which he can make helpful constructive suggestions to his subordinates" implies that the head of a staff, including scientific members, should have at least a sound knowledge of the meaning of their work if he is to present it to the heads of the organisation. One difficulty which is not always fully appreciated by scientific people is the ignorance of scientific terminology and manner of thinking prevalent even among educated people. To write in language and construction which most people can understand the expert must continually keep in mind the need for simplicity and the avoidance of mere erudition. The science student who has not learned at school to write clear and forceful English is at a disadvantage in communicating his results to the unscientific. It does not follow that the more colloquial turn given to his report by the works manager will convey its meaning better. One of the advantages of the functional type of organisation (mentioned in an appendix) is "that specialised work is more economical than unspecialised work when the volume of work is sufficient to keep officials and workmen continuously engaged for the entire period of their employment on specific specialised work." This is, no doubt, true in the limited sense; it is clearly advantageous for a physicist to be occupied all his working time at physics, or even among physicists that an expert on calorimetry should do this if there is enough to fill his time, rather than also dabbling in work on high vacua. But the inevitable tendency, even for workers in different branches of the same science, to get out of touch is not likely to help in the coördination of the sciences or to relate them more closely to the everyday work of the nation. Closer coöperation between the various branches of services is necessary if all are to pull their weight, and this can only come about if each is able by status and attainments to command a proper hearing of his contribution to the solution of the common problems. That this is far from an accomplished fact is clear not only from the matter of the report, but from the fact that it has been deemed necessary to write it.

[1] Price 1s. from the Guild, 6, John-street, Adelphi, W.C.2.

DIAGNOSIS OF TUBERCLE IN CHILDREN.

The early diagnosis of pulmonary tuberculosis in children is often made more difficult by an absence of sputum. Since this is usually swallowed it may be worth while to examine the fæces, but of late years gastric lavage has been increasingly employed to bring the bacilli to light. V. Poulsen, of Copenhagen,[1] recommends that the child's stomach be washed out with a small amount of weak alkaline solution; the material obtained is examined directly, a portion is cultured on Petroff's medium and a portion is inoculated into a guinea-pig. Altogether he has examined 110 children in this way and has found tubercle bacilli in 53. In 38 of the positive cases a successful result was obtained on the first examination, in 12 a second attempt was necessary, while the remaining three cases were positive at the third or fourth examination. For the most part the children excreting tubercle bacilli were under 3 years of age (41 positive in 62 cases), but Poulsen explains this by pointing out that older children suspected of tuberculosis are not often seen by him but go straight to a special tuberculosis department.

> An example of the help given by this method is the case of a 2-year-old child who was admitted with an unexplained pyrexia in August, 1929. Clinical examination was negative

[1] Jahrb. f. Kinderh., 1931 cxxx., 127.

and a radiogram showed some shadows in the mediastinum, but the lungs were clear. Tuberculin tests (Pirquet and Moro) were at first negative, but a week later these tests were positive and at a second attempt tubercle bacilli were grown on Petroff's medium from the results of a stomach wash-out. Further radiographic examination three months later showed evidence of an infiltrative process in the left lung. Meanwhile the child had had the benefit of correct treatment.

Poulsen rightly asks whether the finding of one or two tubercle bacilli by such a comparatively complicated method justifies the serious diagnosis of pulmonary tuberculosis in a child and whether it is fair to put parents to the expense of the costly treatment which such a diagnosis may mean. From his experience he answers both these questions with a definite "yes." It is possible, of course, for the tubercle bacilli to have come from sources other than the lungs. Tuberculosis of the tonsil, a tuberculous ulcer of the stomach, or a caseous tuberculous gland lying in open contact with the lumen of the œsophagus need scarcely be considered, but care must be taken to see that the child's diet does not include milk containing tubercle bacilli. It has been suggested that bacilli may be found in the stomach as harmless saprophytes, just as pneumococci can be found in the mouths of healthy people, but Poulsen is able to quote control experiments by M. R. Christofferson, who examined the results of stomach wash-outs in 47 normal children and obtained a positive result for tubercle bacilli only once in a child who later died of miliary tuberculosis. The method, it is claimed, has its value, not only in cases of suspected pulmonary tuberculosis but also—since a primary lung focus plays an important part in nearly all forms of the disease in childhood—in tuberculous meningitis, generalised tuberculosis, and even "surgical" cases with tuberculosis of bones, joints, or kidneys. Poulsen discusses whether all tuberculin-positive children ought to be submitted to this investigation in order to facilitate early diagnosis of lung involvement, but he concludes that the method is too unpleasant and expensive for this to be practicable. Nevertheless if any suspicion arises about such a child the test should be used so that valuable time may perhaps be saved before clinical and radiographic evidence is available.

HOW TO ORGANISE ACCIDENT PREVENTION.

THE factors concerned with accident causation must be understood if accidents are to be prevented. The study of this question is proving a fascinating one; it is throwing light on problems of healthy activity and industrial efficiency, as well as upon the accident question. A close association is being disclosed between personal health, efficiency, and freedom from accidents. A proper use of guards on dangerous machinery was, 30 years ago, the only accepted method for avoiding industrial accidents. That was the period when antiseptics were entirely relied upon for the prevention of infections; but even then surgery was coming to recognise the importance of the living tissues and the possibilities of asepsis. In the field of accident prevention a similar change has been taking place; machinery guards, like antiseptics, are indispensable in certain cases; but they can, at best, only be of use where machinery is concerned, which means in only some 15 per cent. of all industrial accidents. The personal factor rules in the remaining 85 per cent. Some persons naturally sustain more accidents than do others from the same risk; environmental conditions of heat and cold exert their influence; long hours and poor health are equally important. How this personal factor is influenced can only be ascertained by research, for which purpose reliable records are of first need. An appeal to industrial firms for help in this matter is made by Mr. Eric Farmer, an investigator to the Industrial Health Research Board.[1] He sets out how records should be kept; every accident, however trivial, should be noted, even though such high standard of reporting may send up the gross accident rate. The consequent first-aid care given will, however, as a set off, lower the number of compensatable accidents. The use of the card index method of recording is advocated, since it lends itself readily to investigation. Those workers most prone to sustain accidents form about 25 per cent. of the whole; they may have an accident rate two and a half times greater than that of others. Apparently this small group can be detected beforehand by their reactions to certain simple tests. How far, owing to variations in health, anyone may excel on one day and not on another at such tests has not yet been worked out; nor how far such variations detected in this way might reveal a temporary or a natural tendency to succumb, if exposed to some infection such as influenza. We hope that the needed records, kept on a uniform basis as desired by Mr. Farmer, will be forthcoming, so that many of the obscurities still associated with accident causation, and maybe with sickness occurrence, may be clarified.

SPECIFIC FOOD FACTORS AND DISORDERS OF THE HEART BEAT.

MOST of the recognised vitamins are necessary for the normal growth of the young animal, and at present growth is the only criterion of practical value in testing foodstuffs for some of these accessory factors. This is obviously unsatisfactory. It is clearly desirable that more characteristic effects of vitamin deficiencies should be sought for than failure to promote growth, especially when the material being tested for its vitamin content contains several factors which can only be separated from one another by complicated chemical procedures. The vitamin B complex is a case in point. There are indications that four or five, or even more, distinguishable water-soluble vitamins may be present in such substances as yeast and whole wheat, and the laborious task of examining their distribution and individual properties must obviously be made easier if some characteristic effect be established for the deficiency of each individual factor. Two new papers concerning the effects of vitamin B deficiency on the character of the heart beat may prove useful in sorting out the functions of the various postulated vitamin B fractions. The first[2] deals with the phenomenon of bradycardia observed in rats fed on diets deficient in the vitamin B complex. The normal heart-rate of the rat fed on a complete diet was found by electrocardiography to be in the neighbourhood of 500 beats a minute. Under the influence of vitamin B deficiency this rate was found to fall to 250 to 350 beats a minute in the course of three or four weeks. This slowing of the heart was not an expression of general under-nutrition associated with loss of weight, for it did not appear in animals given a complete diet restricted in quantity to the amount consumed by animals on the deficient diet. Moreover, the heart-

[1] How to Organise Accident Prevention in Works and Factories. By Eric Farmer. Reprint from Industrial Welfare and Personnel Management: the Magazine of Factory and Works Management, 68, Victoria-street, London, S.W.1.

[2] Drury, A. N., Harris, L. J., and Maudsley, C.: Biochem. Jour., 1930, xxiv., 1632.

rate could always be restored to normal within 24 hours by giving an adequate dose of vitamin B, even though the intake of food was limited during this time to the amount previously consumed. Indications were obtained that the specific factor determining this alteration in the heart-rate was the antineuritic vitamin, or vitamin B_1. The electrocardiographic records showed that this bradycardia was of sinus origin, and evidence was obtained that it was in no way controlled by vagal activity. This latter fact distinguishes the condition in the rat from another type of sinus bradycardia which occurs in the pigeon as the result of vitamin B deficiency.[3] Pigeons fed either on polished rice or on a synthetic diet containing fat-soluble vitamins but deficient in the vitamin B complex soon show a fall in the heart-rate from 200 beats a minute to round about 100. Irregularities were found to be common at the lower rates and indicated the development of heart-block. The irregularity of rhythm and the bradycardia were both entirely abolished by vagal section or atropinisation. Attempts to identify the particular food factor concerned in this disorder of the pigeon's heart have not yet been successful. Large doses of the antineuritic vitamin (B_1) failed either to prevent or cure the condition, and neither the heat-stable vitamin B_1 by itself nor the combination of vitamins B_1 and B_2 could bring about a cure. Both yeast and whole wheat contained the factor necessary for the prevention or cure of the condition, but it was not possible to identify it definitely with any of the postulated B factors. It is not claimed that these observations have at present any direct bearing on clinical medicine. In human beri-beri there is no slowing of the pulse except occasionally as a terminal manifestation, and electrocardiographic records of patients suffering from this disease have apparently never revealed the existence of heart-block. Nevertheless, these experiments should furnish a further valuable method of disentangling the components of the vitamin B complex.

ISOLATION ACCOMMODATION IN FEVER HOSPITALS.

APART from more general matters with which we dealt last week (pp. 477 and 495), the central public health committee's report to the London County Council on Feb. 24th contained an interesting paragraph dealing with the avoidance of cross-infections in the Council's fever hospitals, especially in relation to the recent rearrangement of two wards at the South-Eastern Hospital, New Cross. The problem of cross-infection in hospitals for infectious diseases is one which has always presented great difficulties. Cases of this kind are due to the fact that patients admitted to hospital suffering from one infectious disease, such as scarlet fever or diphtheria, are also in the incubation stage of another infection such as measles or chicken-pox which may not manifest itself until a week or more after admission. However promptly such cases are removed from the ward the other patients cannot avoid exposure to the infection. The urgent need of providing isolation within isolation hospitals was realised many years ago by the late Metropolitan Asylums Board and various measures were instituted for the purpose. In some hospitals the provision consists only in a series of small rooms either annexed to the large wards or arranged in a separate building in which there are single-bedded rooms or wards with two or more beds for patients suffering from a combination of the same diseases. In other hospitals in addition to such accommodation one or more wards have been converted into separate chambers by glass and wooden partitions which either reach right up to the ceiling or stop short of it by an interval of varying extent, the object of the glass partition being not only to enable the nurse in charge to supervise her patients but also to avoid the bad effects of solitary confinement on the patients. The North-Eastern Hospital at Tottenham was the first to adopt this scheme many years ago. In some hospitals, such as the Eastern, North-Western, and Western, there is a central corridor with a series of separate chambers opening on to it on either side, while at the South-Eastern Hospital the ward has been so rearranged that the separate chambers occupy the whole breadth of the original ward and open externally on to a verandah. The necessity of providing more isolation accommodation in fever hospitals has been making itself increasingly felt in recent years, so that the late Metropolitan Asylums Board was advised that such accommodation should comprise 33 per cent. of the total beds. It is obvious that these isolation beds are needed not only for patients with cross-infections but also for the reception of sporadic cases of certain notifiable diseases such as cerebro-spinal fever, epidemic encephalitis, dysentery, or mumps, as well as for cases in which the diagnosis on admission is doubtful. Owing to the lack of available space as well as on economical grounds it is probable, and indeed advisable, that such accommodation should be provided not by the construction of new buildings but by the transformation of existing large wards into a series of separate chambers, as has been done in the case of the South-Eastern and the other hospitals mentioned.

THE LOCAL MEDICAL SOCIETY.

MEDICAL men join societies for various reasons and make very varying demands on the societies of their choice. Some are content with a simple clinical meeting for the exchange of experience and the enjoyment of papers by specialists; others add to this some form of social recreation or sport, while others again would have one society provide them with every conceivable facility, from life insurance and legal protection to coöperative stores and dinner-dances. The advantages of this last arrangement are urged by Dr. W. J. Burns[1] in a paper describing the Wayne County Medical Society; he thinks there should be one unit and only one, even if special groups are organised within it. He would apply to the medical society economic and administrative principles which have proved successful in the business world, and describes a programme of education and service as well as a "courtesy programme." He considers that the society should publish a bulletin, with the aid of a live business manager to ensure a good revenue from advertisements. The education of the public should be, in his opinion, in the hands of the medical society, which should deal with problems of contract practice, fraudulent advertising, quackery, and misinformation of the public on matters of health. He speaks favourably of the "Said by Toledo Doctors" column in the daily paper which reflected—or attempted to reflect—the accepted opinion of the medical profession, with the motto of "See your doctor first." A valuable method of bringing the profession into direct contact with the public is the speakers' bureau, which in Toledo sends out an

[3] Carter, C. W.: Ibid., p. 1811.

[1] Minnesota Med., February, 1931, p. 113.

average of 10 lecturers each month to address lay audiences and counteract quack propaganda. The Wayne County Medical Society has for many years successfully maintained a physicians' business bureau, which gives credit ratings on all persons who visit the surgery, in case the doctor doubts their ability or inclination to pay; provides a "delinquent account letter service," and helps physicians who wish to have outstanding accounts adjusted or financed. Moreover, it provides annually a lecture course on economics by prominent laymen. A confidential list for members only contains the names—of course, in code—of people with whom members of the society have experienced unsatisfactory financial relations. Another facility provided by the medical society is the physicians' telephone exchange; every time the telephone rings in the doctor's house a light signal is received in the office of the bureau, and if the doctor fails to answer, the bureau takes the message for him. The "courtesy programme" includes such useful little services as a daily telephone call to inquire after the health of a sick colleague on behalf of the subscriber or a visit from a member of the welfare committee. The happy members of the Wayne County Medical Society enjoy in addition a legal defence system, an income-tax advice bureau, luxurious club rooms, a café, a roof garden, and a careful watch on any attempts of the laity to encroach on the business of medical men.

THE EXPERT WITNESS.

THE growth of modern science has profoundly influenced the evidence heard by courts of law. Not only are technical issues more frequently involved but fresh ways of proving fact are constantly being discovered and elaborated. One consequence of this has been the rise of the expert witness, who in two generations has stepped from a humble position into the front rank. As might be expected, this innovation has aroused considerable opposition. Medical men are familiar with the conflict between the expert medical witness and cross-examining counsel; they are more or less used to being told either that medical witnesses will say anything or that they are careful to say nothing, and that they say what they do say in unintelligible language. It comes to them as rather a surprise, therefore—and perhaps also as rather a relief—to find that they are not the only class of expert witnesses to arouse intense suspicion in the minds of practising lawyers.

On Feb. 27th the Medico-Legal Society discussed a paper by Mr. R. F. G. Churchill on the identification of firearms and bullets. The subject has been well ventilated in the lay press for some years, and Mr. Churchill is conspicuous not only for the range and accuracy of his practical knowledge but for the direct simplicity with which he communicates it. Yet the paper aroused what was almost a storm of legal criticism against firearms experts in particular and scientific witnesses in general. Very little of the criticism bore any relation to the facts, but its volume and pressure were significant. In the opinion of one speaker, for instance, Mr. Churchill's paper and demonstration showed that science could prove anything, while another held that to the ordinary common jury nothing was more dangerous than the expert witness, whom no one in court could understand and whose evidence was crucial. The latter speaker went on to say that as people became more inadequately acquainted with science they attached more and more importance to expert evidence. Others suggested that a witness giving evidence of the type produced by Mr. Churchill could not be effectively cross-examined, and that if he happened for once to be wrong, no one could expose his error. The parallel was drawn between his work and that of the finger-print expert, whose word, it was alleged, was not nowadays questioned, but whose methods deserved closer scrutiny than they received.

The answer seems to be that technical evidence will continue to grow in importance and that the legal profession must keep pace with it. The expert produces his evidence; it is then the business of counsel to examine it appropriately. To do this it is not necessary—even if it were possible—to know the intricacies of every science, but merely the principles common to all forms of investigation. Unless expert evidence is based on careful technique and observation it proves nothing, and no witness is more easily shaken than an expert witness whose evidence is really unsound. The reason why first-class expert witnesses appear alarmingly infallible is that they have already tested their own evidence before bringing it to court. If their evidence will defeat cross-examination, counsel can rest assured that it is true to fact.

OLIVE OIL AND DIGESTION.

A PAPER on the effect of oils on gastric secretion and motility, by W. Morrell Roberts,[1] calls attention again to the therapeutic uses of fat in the form of olive oil in certain digestive disorders. It has been shown experimentally that fats are powerful inhibitors of gastric activity both secretory and motor. Oils act in a peculiar manner in that their inhibitory effect is produced after their entrance into the duodenum. They lessen the normal response of the stomach to food and diminish peristalsis as well as acidity (Roberts). Placed directly into the duodenum through a duodenal tube, fats cause closure of the pylorus and greatly delayed emptying of the gastric contents. They are most effective when given just before meals, since they are then rapidly passed into the duodenum and much diminish the gastric response to food. Oil also seems to have a definitely inhibitory influence upon the psychical secretion, Roberts finds, though it is hard to say exactly how this is brought about. The practical result of this knowledge is that in cases of hypersecretion and hyperperistalsis it is physiologically sound to give oil before a meal. A tablespoonful of olive oil, flavoured if necessary with a little peppermint, before the three principal meals is stated to lessen the discomfort and heart-burn which is apt to come on an hour or two after taking food. Olive oil, and other fats, have the further advantage that they cause copious secretion of bile, as can be readily observed by means of a duodenal catheter. Partly because of this and partly through the action of the fatty acids which are formed during digestion they are also mildly laxative. In gall-bladder disorders, in which reflex gastric hypersecretion is common, pure fats are theoretically valuable in that they are powerful cholagogues and also lessen gastric activity. There is no evidence that fats as such increase the amount of cholesterol in the bile and they need not therefore be forbidden on the ground that they increase the formation of gall-stones; indeed in many cases of cholecystitis and cholelithiasis fats are well borne, and it would be wrong to withhold exactly those foodstuffs which are most capable of emptying the gall-bladder and

[1] Quart. Jour. Med., Jan., 1931, p. 133.

biliary system. The use of olive oil, therefore, given fasting, is often recommended in hyperchlorhydria and in cholecystitis. It plays an important part in the success of the courses of treatment devised by Sippy and Coleman.

PANCREATITIS IN MUMPS.

Dr. M. Bernard Brahdy and Dr. I. H. Scheffer,[1] of the Willard Parker Hospital, New York City, have recently published an instructive paper on the incidence of pancreatitis in mumps, though it is somewhat surprising to find that they make no mention of a paper appearing some years previously in the same journal by L. W. Farnham [2] who collected 119 cases. Only a small proportion of all cases of mumps notified in New York are admitted to hospital, but it is noteworthy that among 252 mumps patients admitted to the Willard Parker Hospital between Jan. 1st, 1929, and March 1st, 1930, as many as 13 developed pancreatitis in from three to nine days after admission. Five were males and eight females. The youngest was aged 6 and the oldest 30, the average age being 17. The pancreatitis appeared from the fifth to the eleventh day of disease, the average being the seventh day. In all but one case both parotid glands were affected. With the exception of one man who developed orchitis none had any complications besides pancreatitis. The principal symptoms were epigastric pain and tenderness, vomiting, and fever. There was no diarrhœa or steatorrhœa, and the urine was free from sugar in every case. All the patients recovered. No mention is made by the writers of the possibility of subsequent diabetes, of which a number of examples have been recorded.[3] Recovery from mumps pancreatitis, however, is the rule and death is very exceptional. In the only two autopsies on record the pancreas showed more or less extensive œdema and fat necrosis. Similar changes were found by Wollstein in the parotid glands of monkeys in which mumps had been produced experimentally.

FUEL GASES.

THE pollution of the air we breathe by the fuel we burn has been brought to public notice by two events this week. The first of these is the publication of the sixteenth report [4] on Atmospheric Pollution which contains, besides the usual detailed tables of deposit, a report of the research committee and of the standing conference of coöperating bodies. Domestic grates are now well recognised to be the principal contributory cause of the smoke nuisance in many of our large towns, and the burning of every ton of raw coal in an open grate has been estimated to cause ten shillings' worth of damage in many areas. Sir Napier Shaw remarks on the cheerful prejudice in the home in favour of the coal fire, and adds that progress will depend much on the production at economic rates of a satisfactory substitute. On the other hand, in the industrial towns of the North the great loss of ultra-violet in the middle of the week is mainly due to factory smoke. In the centre of Sheffield no ultra-violet at all gets through during the months of November and December, and in some towns, Liverpool especially, a push is being made to persuade the small householder that it is inadvisable to burn raw coal. Education rather than coercion has been found effective among the manufacturing community, and may in the long run be the better way of dealing with the domestic polluter; although the methods of the fourteenth century when an individual was tried, condemned to death, and executed for burning soft coal in London command respect.

The second event is the presentation to the London County Council on Tuesday of a joint report of its central public health and public control committees drawing forceful attention to an omission in the report of the Fulham inquiry. The recommendations of the Electricity Commissioners contained, it seems, no requirement for the warming of the effluent gases which had necessarily been cooled by the process of washing to eliminate sulphur compounds. There has been sharp differences of opinion between experts as to whether the carbon dioxide discharged with the flue gases could in any case reach the ground level in sufficient concentration to constitute a danger, but the evidence of Prof. J. S. Haldane and Dr. Owens has satisfied the council that the danger exists and a strong recommendation is going forward to the commissioners. Incidentally Sir Frank Baines has estimated that in the last 25 years the invisible sulphur fumes have caused damage to buildings to the extent of some £60,000,000, and the research committee are developing an apparatus for measuring the amount of this most destructive element of pollution in the air.

IODINE AND GOITRE.

Dr. J. B. Orr has compared the iodine content of foodstuffs in various areas where goitre is common or uncommon among school-children. His report, just published,[1] shows that he encountered a preliminary difficulty in deciding whether the goitre incidence in a given district was high or low, and he suggests that future investigations of this kind should be preceded by a precise survey. The samples taken were specimens of soil, pasture, milk from grazing cows, eggs, potatoes, cabbages, and blood and thyroid from sheep slaughtered in the district. In all, 458 substances were analysed, but the soils have not yet been studied. Dr. Orr admits the wide margin of error possible in quantitative estimations of minute amounts of iodine in organic substances. The method used was ashing in the presence of an alkali, extraction of the iodine from the ash by alcohol, and Winkler's titrimetric estimation. An attempt was made to estimate the amount of error, which proved to be on the average 2·5 per cent., and always negative. Dr. Orr thinks that the results obtained by one worker are fairly comparable. He has not, however, succeeded in obtaining conclusive results; all that can be said is that there appeared to be more iodine in the foodstuffs from a known goitre-free area than in those from areas where goitre is endemic. No definitely goitrous glands were found in sheep, but the lowest level of thyroid iodine was correlated with a low level in pasture and milk. The question whether deficiency of iodine is a cause of goitre and, if so, whether it is the sole cause, remains unanswered.

WE regret to announce the death in his 64th year of Dr. Douglas Drew, which occurred on Feb. 25th at his country house near Bexhill, where he had lived since his semi-retirement through illness some 16 years ago.

WE have also to record the death of Mr. Hugh Percy Dunn, consulting ophthalmic surgeon to the West London Hospital, on March 2nd, at the age of 76.

[1] Amer. Jour. Med. Sci., Feb. 1931, p. 255. [2] Ibid., 1922, clxii., 589.
[3] See Rolleston, J. D., Acute Infectious Diseases, 2nd ed., London, 1929, p. 242.
[4] Observations in the Year ended March 31st, 1930. Department of Scientific and Industrial Research. H.M. Stationery Office. Pp. 74. 4s.

[1] Iodine Supply and Influence of Endemic Goitre. M.R.C. Spec. Rep. Series, No. 154. H.M. Stat. Office. 1931. 4d.

A POST-GRADUATE COURSE

MOTIVES AND MECHANISMS OF THE MIND.*

X.—GUILT AND INFERIORITY.

A.—Guilt.

THE CAUSES OF GUILT.

IT is perhaps as well to begin our study of guilt feelings by pointing out again the primary inborn pattern or *unconscious* tendency, which we may describe as a *hereditary* or general source of guilt feeling, in order to distinguish it from such other *conscious* sources of guilt feeling as may be *acquired* from the experiences of an individual's life-time. The latter can only occur as a modifying or exaggerating influence on the former, which is the more fundamental source, and conscious guilt becomes associated with, and fits into, the preconceived pattern of unconscious guilt. Guilt occupies a very close relationship towards the other "father imago" affects, fear and inferiority, and will be found to be of the greatest importance in the ultimate development of the sex-life in particular, and the satisfaction of "desire" in general.

For instance, it is not at all uncommon for a patient to say in effect, "I always feel that it is wrong for me to be happy, and that I am going to be punished in some way if I feel pleased about anything." This is the basis of many a pessimist's philosophy, and is itself sufficient to justify both his pessimism and his philosophy. In such a patient's mind there is an association between *pleasure* and *punishment* of the simple type, "If I do get what I want, I shall have to be punished for it." This is a direct derivative of father imago feeling, who is felt as punitive towards the primary wish for the mother. So may be developed a conditioned reflex towards all other gratification of desire, by repeating the primary pattern: I want (mother)=pleasure ∴ guilt ∴ fear of punishment (father). Subsequent desire is towards other sexual objects, but the primary pattern or initial conditioned reflex is liable to remain, so that we have a general unconscious equation, *pleasure (in general) or sex (in particular)=guilt=punishment.* It is this fundamental axiom, which is so deeply seated in the unconscious, which requires to be *unlearnt by experience*, with the substitution of other, more conscious and wiser, values, but by no means all of us succeed in doing so. Not only sex, but happiness also, is still in many quarters suffering under the same primitive taboo, both individually and socially. And so the repetitive circle of unconscious guilt and primitive superstition is kept rolling, by the reinforcement by experience of already predisposing tendencies. The problem is not only one which affects the health of those who are obviously psychologically sick, although it is in them that we are able to see its ill-effects most clearly. It is also a social problem, the ramifications of which extend through all the activities, restrictions, and conventions of society, in law, religion, politics, and education. Everywhere there is the same doubt, "Is it right to be happy?" And in sexual matters, at least, the conventional answer is usually a more or less horrified "No!"

There are several common ways in which these primary unconscious guilt feelings may be developed and exaggerated by experience. Any frequent resource to blame or punishment will tend to do so, and many children are blamed and punished for being naughty, whose behaviour is experimentally normal but socially either misunderstood or selfishly inconvenient. There are, however, other and more subtle ways. For example, it is a practice for many parents to allow their children to sleep in the same bedroom with themselves. If they think about it at all, their justification for doing so is a quite reasonable one—namely, that a child of the innocent age of 2 or 3 or even more cannot be expected to know anything about sexual matters, and therefore is not likely to be influenced by anything which may take place in the bedroom. It is quite true that the child does not "know" much about sex, but the mistake lies in thinking that it is necessary to "know"—i.e., to be conscious of, sex, in order to be emotionally influenced by overheard intimacies. The experience is not a conscious one and does not relate to *consciousness*, but it may arouse a very deep *feeling state*, which is all the more important because there is no consciousness with which to correct it. The probability is that very soon after the child is a year old its feelings, *quite apart from any consciousness of them*, can be influenced to some extent by what it may see or hear of its parents' sexual experiences. It is just at this time that the child's emotional orientation is most definitely associated with guilt, owing to the phase through which it is passing. Stimulation of sexual feeling will, therefore, cause both guilt and conflict, and the fact that there is no consciousness of what is happening keeps the experience at an emotional level, without possibility of outlet. It would seem to be wise, therefore, for children to sleep in a separate room from their parents, where this is possible, after they are about a year old.

It may be asked why it is, if this is the case, that under circumstances where overcrowding is inevitable, such as the slums, the feeling of guilt is not stronger than it is under conditions where there is more opportunity for social hygiene? It must be remembered, however, that guilt is relative to the conventional standard of the environment in which the individual is placed. The conventional standard, and therefore the measure of guilt, is necessarily different in the lower classes of society, and in any case the human mind is blest with a very large measure of adaptability. It is not suggested that the child who sleeps in the same room with the parents up to 3 or 4 years of age is inevitably bound to develop a neurosis, but only that *if the potentiality exists* there is an additional likelihood of its development under these circumstances.

Because guilt is relative to the external standard which authority imposes, if the parental attitude towards excretory function and sexual matters is of the conventional (and unconsciously defensive) "hush-hush" type, this is the measure of guilt which is additionally imposed upon the child. Much guilt may be acquired from this source, through the suggestive influences of early environment. It is important, therefore, to remove as far as possible all association of guilt and prudishness from the excretory functions, from which it may later so easily and unconsciously become transferred to sex. Where the parental attitude is of the "Calvinistic" type, and the religious teaching is in terms of sin and punishment, the guilt

* A course of 12 lectures delivered under the auspices of the Tavistock Clinic, Tavistock-square, by Dr. E. Graham Howe during the autumn session of 1930. Earlier lectures of the series have appeared weekly in THE LANCET since Jan. 3rd. The second part of Lecture X. will appear next week.

feeling is liable to become exaggerated to a very dangerous extent, and is a very common source of subsequent neurotic development.

A great many people have, at some time, been exposed to some degree of "sexual trauma." Sexual exhibitionism occurs more frequently perhaps than is generally realised, and many young girls have seen at some time the indecent exposure of male genital organs. The only way in which it is possible to explain the affect and conflict which may be so intensely aroused in a small child of 5 or 10 by such an experience, is to realise that it is not a matter of consciousness, but of inborn feeling, which causes them to be so stirred emotionally by what they have seen. *All premature sexual stimulation gives rise to guilt feeling*, and it is for this reason that it is so undesirable that it should occur.

A boy taken into his mother's bed, say, at the age of 5 or 10, after the death of his father, is subjected to an emotional strain which cannot possibly be realised by any parent who is seeking to find comfort in this way from an emotional loss. The effect is always dangerous and frequently disastrous upon the child's emotional development.

It is probable that all guilt in adolescence is fundamentally associated with sexual guilt, even if it is apparently associated with some other cause, such as stealing or lying. The feeling of guilt is anticipatory of punishment, and the punisher is unconsciously associated with the "father imago." The boy who has been subjected to a public thrashing for stealing at his school may very easily suffer thereafter from an increase in his feeling of guilt and shame, which will effect the subsequent development of his sexual life, as well as his general attitude towards authority.

We may distinguish at this point between guilt and shame. Guilt is what we feel about ourselves, irrespective of what anybody else may know about us. Shame, on the other hand, involves the additional feeling that someone else may be aware of our guilt. It is important to remember that guilt is one of the "transferred affects." It can never be an isolated phenomenon relating only to a single experience. It is always developed in continuity with past experience and refers back primarily to its unconscious source.

THE FUNCTION OF GUILT.

The primitive functions of fear and guilt are probably somewhat similar. The one is associated with physical, the other with moral, safety. In both cases, however, it would seem that their biological utility becomes less important with the development of the human race. Guilt is only protective through its association with fear of punishment, and this, although it may be necessary in early days, is a psychological motive which with development becomes progressively less desirable. The probability would seem to be that the mature and healthy mind should feel none of this kind of guilt at all, nor in fact any fear of punishment. It is easy enough to compel the discipline of a family or of a nation by fear of punishment, but the disadvantage of this method is that it keeps its members in a state of dependent immaturity. The psychological ideal is to escape from all such feelings of fear, guilt, and inferiority, through growth to what may be described as a state of "co-operative individualism."

From a rather different point of view guilt may have another important function, which is to establish individual independence through rebellion against the dominance of authority. The boy who is persistently "naughty" is probably trying to exercise his independence, and he feels that one way in which he can do so is by disobeying authority. Authority expects us always to do the right thing, therefore a rebellious independence will show itself by a tendency always to do the wrong thing. "*Naughtiness*" *is often purposive*, and we may choose to be "guilty" as a means of exercising our independence. It is a pity that this should be so because, as has already been mentioned above, the psychological ideal is that independence should be achieved not by being guilty, nor by slavish imitation of conventional morals, but by our own free choice of a higher ideal of behaviour. Naughtiness in children is often caused by the so-called "goodness" and conventional moral expectations of grown-ups. As soon as the child realises that there is nothing to be gained by playing fast and loose with adult conventions, he will usually settle down to become a good citizen.

Superstition and obsessional neurosis.—All superstitions are based upon a *fear of punishment*, and seek to deflect it by an *act of propitiation of a symbolical kind*, addressed towards "whatever gods there be," derived from father imago. Superstition is thus deep-rooted in the human race, and it is liable to unconsciously motivate the behaviour of a great many of us. But to be thus dominated by superstition is to be dominated by the unconscious motives of fear and guilt, and is very closely associated with neurosis.

It is in obsessional neurosis that this defensive and propitiatory mechanism is given the fullest expression, and it may be developed to such an extent as to absorb almost the whole of the energy of life. The apparently ridiculous repetitive rituals of hand-washing, touching objects, or counting, are not so purposeless as they seem. The patient will say "I cannot help it, however much I fight against it the compulsion is too strong for me. *I feel that if I do not do it just in the right way something awful will happen to me, and then I have to go on doing it.*" Obsessional neurosis is a defensive propitiatory ritual, expressed in some form of symbolism, which at the same time usually both satisfies an infantile and unconscious wish, and seeks to remove an intolerable feeling of guilt. Its motivation is therefore unconscious, although its behaviour is purposive, and it is therefore beyond the patient's conscious power to control.

DEFENCE MECHANISMS.

The defence mechanisms associated with guilt may be classified as follows: Repression, over-compensation, projection, identification, self-punishment.

Repression.—The inevitable tendency of an intolerable exaggeration of the guilt feeling is that it should be repressed from consciousness. But the result is not only an elimination of guilt, but also of more or less all *normal sexuality*. Repression must not be confused with suppression or sublimation. With suppression the process is conscious and the sex life remains potentially under control, whereas with repression it is both out of consciousness and out of control. Sublimation, on the other hand, neither suppresses nor represses, but raises the motive above the level at which guilt is felt and expresses it through some higher channel. Sublimation, however, is comparatively difficult to achieve, and our patients have usually followed the easier path of repression in order to preserve their emotional stability.

Over-compensation.—"All is not gold that glitters," nor is all good that looks good. The common over-compensation for a feeling of guilt is *priggishness*,

but there is all the difference between the "goody-goody" boy who is an over-compensated prig, and the really good one who is at times quite naturally naughty. The popular judgment of the prig is based upon a very sound estimate as to his true worth. It requires only a very little knowledge of psychology to value the common over-compensations as shams, which only serve to disguise a very different state of affairs underneath. Priggishness is a defensive mask for a feeling of intolerable guilt, and where the one is the other is not far behind.

In Lecture VII. reference was made to "Messianic identification" as an over-compensation for a feeling of guilt, and the danger of such an exaggerated standard was pointed out, because it left the primary basis of feeling and desire largely unchanged and liable to be causative of conflict and symptom formation. There are, however, more subtle ways in which this mechanism operates, and they are particularly to be found in the numerous forms of obsessional neurosis, in which a *compulsive rectitude* is sought to cover and compensate for the feeling of guilt. The repetitive hand-washing mania is an example of this type, but the same mechanism may be found seeking through various symbols of a more or less concrete kind for some solution of the same unconscious problem. The characteristic psychological attitude in all such cases is found to be one of *over-conscientiousness*, which exists quite apart from the obsessions themselves. All such standards of achievement as may be classified under the heading of "compulsive perfection," in which the idea of failure is an intolerable one, are thus probably closely allied with obsessional neurosis. They form a most important group in their liability to mental breakdown, because a combination of emotional repression (with thinking in its stead) together with a standard of compulsive perfection is obviously going to lead to persistent, unnecessary, and uncontrollable "overwork."

Projection.—The prig is generally at his happiest when he is finding fault with other people's misdemeanours. The mechanism in this case is one of vicarious satisfaction and probably involves identification also. The "nosy Parker," who spends his time in searching the public parks for acts of indecency, is a bad example of unconscious psychological mechanisms.

The "purity leagues," with the best intentions, do a great deal of harm by exaggerating the importance of sexual guilt, because they usually refer in no uncertain terms to the disastrous physical and moral punishments which await the wrong-doer. The well-meaning pamphlets circulated to adolescents about masturbation are often only examples of an unconscious projection mechanism, and may have the unfortunate effect of doing more harm than good by exaggerating fear and guilt. It is probably true to say that such pamphlets do more harm than the minor offences which they seek to eradicate. The frequency with which patients unconsciously tend to refer to masturbation as the cause of all their illnesses and misfortunes is not lessened by the fact that they have often read that such is the case in purity pamphlets.

Identification is another means of satisfying sexual desire and at the same time avoiding its accompanying guilt feeling. When we read all the gloomy sexual details of matrimonial misfortunes in the newspapers, it is not difficult to realise that we are being personally involved in them through the mechanism of identification. There would not be so much of this type of information in the newspapers were it not that there is a substantial public appetite for such details. It is very difficult to estimate the effect on the public mind, especially in the case of juveniles, of much that passes on the cinematograph screen, when we realise that the satisfaction derived is a vicarious one through the mechanism of identification, which serves to stimulate passions which were before, in many cases, in abeyance. The effect is not, perhaps, wholly harmful, since such vicarious experience provides to some extent an outlet, but it is not without danger. Carried to a further degree of psychopathology, we are familiar with the "voyeur," who, to make up for his own repression and the failure of his normal sexual development, is compelled to obtain his satisfaction from observation of some act of physical intimacy in others.

Self-punishment.—The problem of self-punishment is particularly important in psychopathology. The purpose of this principle is an unconscious defensive one, being to administer the punitive blow first to oneself, in order, by so doing, to escape what may be presumed to be something worse at the hands of the punitive "father." In primitive races *sacrifice* is a very important example of this mechanism, by which the gods are placated by a gift, which is at the same time a loss to the individual suppliant. The primitive mind is often seeking in this manner to "buy off" the punitive gods by presents and sacrifices, of which many examples occur in the Old Testament.

> "If thy right eye offendeth thee, pluck it out . . . If thy right arm offendeth thee, cut it off and cast it from thee for it is better for thee that one of thy members should perish and not that thy whole body should be cast into hell." (St. Matthew, v., 29–30.)

The use which may be made of such texts as these fits in very readily with the pre-existent unconscious tendency towards self-punishment.

The *castration motive* is one of the common directions which self-punishment, as an escape from guilt, is liable to take. Castration is an act of self-deprivation and self-punishment in which one becomes identified with the punitive father, and by the act of sacrificial de-sexualisation escapes from all consequences of guilt. In neurotics it has many forms more subtle than those occasional cases of sexual self-damage which may occur with knife or razor in psychosis.

It is interesting in this connexion to consider the practice of *circumcision*. It is probable that, in the first place, its conscious justification was as a means to preserve hygiene in a hot, sandy, and highly infected country. On the other hand, its unconscious emotional ætiology must not be omitted. It was an act performed as a ritual by a father figure, which on the one hand involved the loss of a part of the sexual organ, and on the other was an act of initiation into the sex life of the tribe. It partook, therefore, of the character of an act of sacrifice. The medical profession is inclined to regard circumcision entirely from the physical point of view, and to omit its deeper psychological significance. If it is to be done at all, it is important that it should be done in early infancy in order to minimise its effect as an unconscious trauma. At a later date it may become associated in the unconscious of a potential neurotic with acts of punishment and castration ritual, with the doctor quite unwittingly in the rôle of father figure, and may precipitate very undesirable developments. It is probably necessary for the neurotic tendency to be there in the first place, but it is interesting to note that such a common operation as appendicitis is also liable to be ascribed by the patient to castration punishment, as if one "tail" were equal in value, to the unconscious, to another.

Where a man, prior to marriage, takes his anxieties to his doctor and suggests circumcision, it is necessary for the physician to tread very warily, because he is on dangerous ground. To the unconscious, circumcision has a castration value and, if prior to marriage the patient has got a wish to be castrated, it bodes ill for future matrimonial success, and a surgical operation of this kind is liable merely to reinforce pre-existent unconscious motives.

THE CONSEQUENCES OF GUILT.

It is impossible to estimate the price that we pay for the continued existence of our primitive unconscious guilt feelings. It is probable that as a single source of sorrow, it is by far the greatest in the world. There is nothing which so intimately touches the lives and happiness of every individual as matters appertaining to sex and guilt. It is impossible to go into this subject in the detail which it deserves, but it is probably not too much to say that the sexual factor is responsible for most of the commonest examples of mental ill-health, besides much that passes for physical disorder, and also for much unhappiness that does not come into the hands either of the doctor or the lawyer, but is borne at home more or less in silence.

Let us consider for a moment some of the consequences of guilt. Owing to the general absence of any sexual hygiene or practical instruction, the boy masturbates and the guilt which is associated with that action then reinforces primary unconscious guilt feelings and tends to become transferred to any later sexual activity. It is suggested that most men, particularly in this country, are not entirely free from a certain sexual priggishness, sentimentality, ignorance, or wrong sense of values, which is liable to make of them in marriage blind leaders of the blind.

The girl enters upon marriage usually quite unprepared, afraid of herself, her body, and her emotions, and if not entirely ignorant of what is expected of her, probably partly misinformed. It would be interesting, if it were possible, to obtain statistics as to the relative successes and disappointments of the honeymoon. They would probably make depressing reading, in spite of the sentimental value with which that period is invested. How could it be otherwise, when both the man and the woman are usually so much worse than unprepared for what is in fact by no means the easy instinctive business which some people are inclined to believe it to be? The consequence of guilt in the man, and of his ignorance of feminine psychology, is that very frequently the wife is not sexually satisfied, suffering what in some cases may be tantamount to the agonies of rape. Again it is impossible to obtain reliable statistics, but inquiry would seem to show that a very large proportion of women find their sex life, which should be so much more, only a trial and a disappointment.

The consequences are threefold. Firstly, the husband and wife find that what should be binding them together is driving them apart. Sexual frustration and disappointment is probably the commonest cause of matrimonial trouble, distributed, through the mechanism of "transferred affects," on to any insignificant excuse for something about which to complain. Secondly, the love which should be satisfied mutually between husband and wife, being to some extent frustrated, seeks to attach itself elsewhere, either in illicit partnership, or as is very often the case, upon the children of the union. *Parents need to be sexually happy themselves before their attitude can be all that it should be towards their children.* If this is not the case, the wrong type of love tends to be attached to the child, giving rise to an exaggeration of the already potential Œdipus and Electra motives. Sexual feelings and experiences that are feared or disliked, exaggerate the already potential tendency to speak of sex in hushed and guilty whispers, and the vicious circle is started again, encouraging the development of unconscious factors and neurotic mechanisms in the child. Thirdly, the normal psychological development of the child depends largely upon the example of the parents for its development. The bringing up of a healthy family depends upon the health and happiness of the parents. Children can very readily sense friction between parents, even if it is not given overt expression. If they get the impression that marriage is not a happy state, they will not approach it themselves in the way in which they should.

The need for sexual hygiene is probably greater, from the point of view of social happiness, than anything else at the present time. Sex is not an instinctive business which takes care of itself, because it is so largely distorted by protective unconscious mechanisms and neurotic manifestations. *Our attitude towards sex is inevitably wrong whilst it is unconscious and instinctive, and requires a great deal of education, organisation, and common sense before it can be put right.*

CASE Z.—Male, unmarried, university graduate (double first), age 23.

Complained of: Suicidal depression. A compulsive and destructive tendency towards self-analysis. Lack of concentration.

History: He was an only child. The following extracts are taken from the autobiography which he wrote early in his treatment.

"I slept in the same room as my mother and father until I was 12. I remember lying in bed with my mother, and uncovering and sucking her nipple. She seemed half annoyed and half pleased. I often got into my mother's bed after breakfast. She was an invalid. I call it dirty now, morbid curiosity. I used to play that my father and mother were King and Queen of Scotland, and I was Field Marshal Johnson, dressed up in armour and plumes. I used to publish daily and weekly papers with accounts of my victories for my mother to read. I dressed up every Sunday for three years, and all the maids came in for audience. I could not bear to be teased and went into blind rages, when I used to lie on the floor and howl. I always used to run to my mother for protection. I was wheeled about in a pram until I was 9. At about 5 I found a stone in the shape of a ring and twice went through an elaborate ceremony of marrying my mother. I was very frightened of my father and called him the "brigand."

At 5 my thumb-nail, which I had caught in a door, came off during family prayers, right in the middle of the Lord's Prayer, to my great delight." (The loss of the finger-nail is associated in the unconscious with castration.)

He went to the university where his intellectual brilliance earned him a double first, after which he was awarded a travelling scholarship. While he was abroad he fell in love with a German girl, but this aroused intolerable conflict and he had a nervous breakdown which nearly resulted in suicide. He was taken into a nursing home where the following incidents occurred.

One day he was in the workshop repairing some shoes. He said, "First I cut one finger and then the other. I knew the knife was going to slip again and it did, right across the top of both legs. I had to have three stitches in my leg. I knew it was not an accident, because I was expecting it to happen all the time, but I could not prevent myself from doing it."

Another time he was in a barber's shop getting his hair cut, when he felt a compulsion to tip the barber. This was a thing he had never done before, because he said he always hated barbers. When asked why, he said, "because they talked too much." (Rationalisation: barbers are associated in the unconscious with castration, because the hair is associated with virility.) This time he walked out as usual without tipping the barber, but he had not gone far before he felt compelled to return to do so. He re-entered the shop and made the excuse of buying some hair-oil, but in a state of acute distress walked out again, without having tipped the barber. Again he had to return and this time his excuse was to buy some razor blades, but his barber had

(*Continued at foot of next page.*)

SPECIAL ARTICLES

PASTEURISATION IN RELATION TO MILK DISTRIBUTION.

By William G. Savage, M.D., B.Sc. Lond.,
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While there are numerous reports dealing with the hygienic production of milk and the various conditions which affect its bacterial content, inadequate attention is usually paid to the effect of suggested reforms upon the practical side of milk distribution. While in our big cities, and particularly in London, the distribution of milk falls more and more into the hands of large distributing companies, it remains true that there are still innumerable small distributors whose livelihood depends upon milk and who play a considerable part in the distribution of milk, often with benefit to the community. For example, the Departmental Committee on Distribution and Prices of Agricultural Produce in their interim report issued in 1923 [1] remark: "It has been stated to us in evidence that at least a quarter of the total quantity of milk consumed in its liquid form is distributed directly by producer-retailers who are farmers or cowkeepers retailing their own milk." Besides these there is the small retailer who obtains his milk from local sources and not from a wholesale dealer, and adding these the same report computes them as bringing up this small scale distribution to half the total quantity of liquid milk consumed.

To adopt measures which will squeeze out these small operators has some merits as such, but if it plays into the hands of large combines it may be of very dubious benefit to the milk consumer. It is essential to avoid anything in the nature of a monopoly in the distribution of milk. These questions are particularly applicable to the problem of the compulsory pasteurisation of all milk-supplies, a problem which not only is one much under consideration, but which is one upon which we have sooner or later to come to a definite decision.

Nearly all the discussion upon pasteurisation in this country centres round its two scientific aspects—i.e., will it render milk safe from the risk of conveying harmful bacteria; will it damage milk as a nutritive food? A third aspect merits consideration which is its effect as an administrative measure, if it is put into operation.

I have discussed in detail elsewhere [2] the scientific aspects of pasteurisation, and it would be outside the scope of this paper to review them here. I am prepared to accept that pasteurisation, if efficiently carried out and adequately controlled, will very largely remove the danger of bacterial diseases being carried by milk. I do not think that its opponents have demonstrated, when efficiently performed, that it does any material damage to any known nutritional factor in milk, but the last word has not been said on this side and our knowledge is admittedly incomplete. Taking for granted its scientific applicability, I propose to confine attention to the economic considerations implicated.

An Ideal Milk.

In the first place it must be emphasised that the ideal condition, far superior to anything else, is pure raw milk, untreated by heat, unmanipulated, except that it is kept as cool as possible, obtained from clean cows free from disease, and handled throughout with scrupulous cleanliness by persons who run no risk of conveying harmful bacteria to the milk. While such an ideal milk may be attainable for the few it is impracticable for the many and, as regards the general milk-supply, none of these conditions can be obtained. As regards cows the main danger is tuberculosis, and the most scientific way of eliminating the risk is by a thorough and well-thought-out policy of dealing with bovine tuberculosis. The practical difficulties are enormous, and of the enforcement of such a policy there is no trace or any evidence that the agricultural interests involved are prepared to face the problem or willing to submit to the restrictions necessary to its effective realisation. None of the methods now in operation do more than touch the fringe of the problem.

The control of milk handlers has been tightened up by the Milk and Dairies Order of 1926, but it is a difficult problem and, at its best, hard to control effectively on a basis of notification and the reporting of suspected cases. Theoretically this 1926 Order should also give us clean milk, or, at least, reasonably clean milk free from a large number of bacteria, but in its practical operation it is largely a dead letter, and it would be difficult to visit a series of farms in any rural district without finding on all of them extensive and serious evasions of its provisions. Marked improvements there have been during the past 10 years, but improvement only from mostly very unsatisfactory conditions.

If these statements are true we are driven to consider pasteurisation not as an ideal solution but as a second-best procedure because the best is unattainable. Considering it as a public health measure for the protection of the milk consumer it is necessary to discuss in some detail the economic and practical questions involved and the extent to which they can be removed or their evils minimised.

Pasteurisation should be a scientific form of heat treatment, and as such involves precise definitions of time and of temperature. Most scientists in this country are prepared to accept the Ministry of Health definition of scientific pasteurisation as set out in the Milk (Special Designations) Order, 1923. This requires that the milk shall be "retained at a temperature of not less than 145° and not more than 150° F. for at least half an hour, and be immediately cooled to a temperature of not more than 55° F."

"Flash" Pasteurisation.

Practically all our data in this country are based upon this definition, and if any other is used at once the efficiency of the process is in question. It follows, therefore, that when discussing the legal authorisation of pasteurisation it is necessary to

(*Continued from opposite page.*)

disappeared, and he could not tip him after all. He said that he felt sure that if he could have tipped him in the first place, all would have been well. He suggested of his own accord that the barber represented "cutting" and the hair "manhood."

There were other evidences in this patient of castration symbolism, but three have been mentioned here—viz., the thumb-nail, the knife, and the barber's scissors. It is possible that his impulse to commit suicide, which is a gesture of self-destruction, self-punishment, and self-sacrifice, was also an example of the same castration symbolism.

restrict the term to this exact definition and to no other conditions of time or temperature. For we should forbid the use of the term "pasteurised" to any other form of heat treatment. In practice far more milk is heat treated by "flash" pasteurisation —i.e., heating for a very short time, measured in fractions of a minute, to a much higher temperature, usually a variable temperature, than is heat treated under the above definition. Such treatment has no health objective, it is merely a trade practice to allow the milk to reach its destination in a saleable condition. This raises the practical question as to whether all forms of heat treatment other than designated pasteurisation is to be prohibited. Undoubtedly this could not be done at once, as suitable plant takes time to install, while without some form of heat treatment milk losses would be enormous, particularly in the warm seasons, so bacteriologically contaminated are many milk consignments as now delivered to these milk depôts.

The following is a random sample from our laboratory of 10 samples all collected one day (May 5th, 1930) as delivered to one milk depôt in Somerset. All the milk is at once mixed and is flash pasteurised, summer and winter. All the samples were milked that day, and all were only a few miles from the depôt (Table I.).

TABLE I.

Source.	Organisms per c.cm.	*B. coli* per c.cm.	Marking.*
Farm—			
A, Low Ham ..	672,000	3000–10,000.	Very bad.
B, ,, ,, ..	3,400	Less than 10.	Very good.
C, ,, ,, ..	8,400	,,	,,
D, High Ham ..	172,000	Over 10,000.	Very bad.
E, Low Ham ..	424,000	,,	,,
F, ,, ,, ..	10,200	10–30.	Good.
G, ,, ,, ..	1,136,000	3000–10,000.	Very bad.
H, ,, ,, ..	12,300	10–30.	Good.
J, ,, ,, ..	168,000	Less than 10.	Poor.
K, High Ham ..	848,000	100–300.	Bad.

* The so-called standard of Grade A milk—i.e., not more than 200,000 bacteria per c.cm. and no coliform bacilli in 0·01 c.cm. is often adopted as "good" so far as milk is concerned. It is forgotten that this standard is framed on the basis of the sample being collected "at any time before delivery to the consumer." To comply with this condition samples collected at the farm must have a bacterial content very far below these figures. An entirely different standard is necessary for samples collected at the cowshed or as for the above when sampled within a few hours of milking. This mistake is constantly being made in published reports, and milk samples are recorded as up to Grade A standard, the time factor since collection being entirely ignored.

Pasteurisation Problems.

At the present time not only is any type of heat treatment allowed but there is no obligation to disclose the fact, and, indeed, it never is disclosed to the general public. There is nothing to prevent milk distributors heat treating milk more than once, and there is evidence that a certain amount of milk is so heated.

The difficulties of imperfect pasteurisation plant can be got over by the enforcement of a time limit, for it is obviously illogical to permit the continuance indefinitely of an admittedly unsafe and imperfect procedure. Since the public has a right to know if it is being supplied with heated milk, all heat-treated milk should be required to be adequately labelled—i.e., either as "pasteurised" milk or with some other suitable designation, such as "heat-treated milk not inspected," after the expiration of the time limit for unsuitable pasteurisation, the latter label would disappear.

The problems of designated pasteurisation do not end with a definition of time and temperature conditions. The official description quoted above also states: "The type of apparatus used for pasteurising and the methods employed shall be such as are satisfactory to the licensing authority." Pasteurisation is a technical process of considerable complexity, and while machines may be designed to carry out official regulations it does not follow either that they will comply with scientific requirements, that if satisfactory at first they will remain efficient, or that as operated they will be worked to attain and maintain efficiency. In U.S.A., where the practical experience of pasteurisation is so extensive, considerable trouble on the technical side has been met with and has given rise to much discussion.

For example, Putnam[3] describing commercial pasteurisation plants in Chicago enumerates five groups of defects which may be found. The first is dead-ends at the outlets, the milk in these parts not being raised, or kept, at the required temperature. A second defect is leakage through valves; another is due to the collection of foam (a mixture of milk and air) in the upper part of the holder pasteuriser which fails to receive the adequate temperature treatment. Approximately 30 per cent. of the Chicago positive holder pasteurisers showed this defect. The fourth is the use of continuous-flow holders. The last defect mentioned is the human element, as the author recognises that after every mechanical defect has been remedied, ignorance and improper working methods may result in defective heat treatment. Frank, Moss, and Le Fevre[4] also discuss these defects and their remedies. It is agreed that, except as regards the human factor, these defects can be obviated, but their possibility shows how important is adequate technical control and efficient inspection.

Economic and Administrative Considerations.

The economic effects of any system of compulsory pasteurisation demand very careful consideration.

The first is the question of direct additional cost. We cannot manipulate milk without cost and all of it is passed on to the consumer. While flash pasteurisation is comparatively inexpensive, holder-type pasteurisers of efficient type are expensive and cost anything upwards from £150 or so. The possibility of this as a charge on a small distributor is considered below. The running charges are also material. The Interim Report[1] already quoted states: "In cases where the process has been separately costed, pasteurisation, including clarifying and cooling, is normally the most important single item in the wholesaler's expenses. The estimates of this cost which we have received vary from ½*d.* to slightly below 2*d.* per gallon. Most generally it has been calculated at about 1½*d.*" This applies to all types of pasteurisation and not only to the more expensive holder variety. An offset to this is the saving on soured milk.

The most important administrative consideration in relation to compulsory pasteurisation is its effect upon the present systems of milk distribution. Since knowledge of these conditions is an essential part of the problem, I have studied it in detail in the largest of the 17 rural areas in the County of Somerset, one in which dairy work is the main rural industry. I am much indebted to Mr. H. R. Day, the milk inspector, for obtaining the necessary details. In this area (Axbridge Rural District) I have particulars of 764 milk producers.

MILK PRODUCTION AND DISTRIBUTION IN AXBRIDGE RURAL.

The size of the herds vary greatly per farm as is shown in Table II.

Practically two-thirds are quite small men with under 20 cows, and, of course, some of these are dry cows. Their milk is distributed in a variety of ways, and

TABLE II.

Total dairy cattle under 5	68	Small	
,, ,, ,, 5 to 9 (incl.)	173	Small	65·3 %
,, ,, ,, 10 ,, 19	247	Small	
,, ,, ,, 20 ,, 29	133	Medium	
,, ,, ,, 30 ,, 39	75	Medium	27·9 %
,, ,, ,, 40 ,, 49	34	Large	
,, ,, ,, 50 ,, 59	9	Large	6·8 %
,, ,, ,, 60 and over	8	Large	
	747		

these have been analysed carefully in the returns, all made after special visits to the farms, and may be grouped as follows (Table III.):—

TABLE III.—DISTRIBUTION OF THE MILK.

	Number of Producers.	Percentage.
Sold to a factory depôt	337	44·1
Sold to a small local distributor	156	20·4
Sent direct out of the county to a town distributor	102	13·3
Purveyed by the producer	67	8·8
Made into cheese or butter (including a very few in which mainly kept for stock)	102	13·3
	764	

Some variation with season occurs—i.e., some make cheese in the summer and sell in winter; but the figures represent the facts at the time of inquiry, dealing with the main method of disposal.

What is called in the Table a "factory-depôt" represents a marked feature of the milk business in Somerset, there being between 50 and 60 of them in the county. Those in the particular district studied with several in adjacent rural areas taking milk from this district are nine in number. While they vary in size and in the amount of milk they handle, the latter varying from about 600 gallons to 4000 gallons or so per day, they have certain features in common. The milk is in part fetched by lorries run by the milk companies owning the depôts, in part brought in by the farmers themselves. Mostly delivery is twice daily; in some cases one-day deliveries are accepted. At these depôts the milk is mixed, usually cleaned, always cooled and always pasteurised, summer and winter, with one exception. In these particular depôts in all but two the pasteurisation is by "flash" process, practically uncontrolled as regards any exactitude of working or control. In two there is a type of holder process. The latter is really uncontrolled also, since neither has any automatic recording temperature charts nor is there any outside supervision of the plant. In no instance is the milk sold under the Ministry of Health licence as "pasteurised." Their pasteurisation is entirely for trade purposes. From these depôts the milk is sent away to large towns or, if a surplus, deviated away to other centres for condensed milk, dried milk, cheese manufacture, &c. Several, not connected with other depôts, utilise their surplus to make cheese. The smaller local distributors form an interesting group. When they develop considerably they pass into the depôt type, but usually it is possible clearly to separate the type.

Table IV. gives particulars of some of the smaller distributors in this area, while the last two in the Table are definitely of the milk-depôt type with specially built premises and a considerable milk turnover.

In the third group the milk is sent direct by rail or motor lorry to a town—Bristol, Cardiff, London, &c. It is almost invariably cooled (98 cooled, 4 not cooled) and is usually only despatched once a day. At the town it forms part of an urban distributors supply and may be sold unpasteurised with its identity distinct or may be mixed with milk from many other sources, pasteurised and distributed. The area studied is not very far from Bristol, so the proportion

TABLE IV.

Distributor.	Milk dealt with.	Heat treatment.	If collect milk themselves.
A	9 farms.	None.	No; producers bring it in.
B	4 ,,	,,	,, ,, ,,
C	34 ,,	,,	Collect part.
D	61 ,,	Flash P.	,,
E	25 ,,	None.	,,
F	12 ,,	,,	Collect some.
G	1000–3000 gal. per day.	Flash P.	Collect a considerable part.
H	700–1800 gal. per day.	,,	,, ,, ,,

No cooling plant. None of these distributors bottles upon the premises.

(13·3 per cent.) of milk so dealt with is probably considerably higher than from the county as a whole.

In 67 instances the milk is purveyed by the producer. For the most part these producer-distributors sell only their own milk, but in some cases they take the output from another farm. If they expand sufficiently to dispose of the milk from a number of farms they pass insensibly into the second group and there is no absolute dividing line. In this group there is no heat treatment at all. It is surprising, however, to note that slightly over 50 per cent. did not even cool their milk. They distribute the milk shortly after collection and without any manipulative treatment beyond straining. Some take great care over production, but with the majority their methods and practice are at the ordinary low level. The price at which they sell is not based upon costs but upon the ruling milk price, so since their distribution costs are usually low the undertaking is fairly profitable.

The area investigated is a cheese-producing district, so over 13 per cent. are cheese (and butter) makers only. Although a little designated milk (Grade A (T.T.)) is sold in the area, only one of the 764 milk producers has a licence for the production of a designated milk (Grade A).

Permissive Compulsory Pasteurisation.

The above facts as to the distribution of milk from a particular area will help us to visualise the effect of any system of compulsory efficient pasteurisation. There are no inherent difficulties in the way of the larger milk depôts installing efficient pasteurisers. On the other hand, the milk handled by the small local distributors is not large enough to enable them to install and work efficient pasteurisation plants and probably nearly all of them would have to go out of business. The same applies to the 8·8 per cent. purveyed by the producers. Excluding the cheese makers these two groups form 33·7 per cent. of the whole, while they probably handle more than one-third of the milk produced. While many of their methods are far from satisfactory their total elimination would be a loss. Their existence serves indirectly as a powerful means of keeping down milk prices, as an alternative to selling to a combine. Some of them have built up excellent milk distribution businesses by personal attention and by some measure of selection from farms where cleanly methods are practised. Their milk has an identity which is prized and valued by, at least, some of their customers.

I consider that any system of universal compulsory pasteurisation of milk is impracticable. U.S.A. is

repeatedly quoted as the home of pasteurisation, but it is commonly forgotten that general pasteurisation only applies to the large towns and that 90 per cent. of milk consumed in rural areas is unpasteurised. In view, however, of the apathy of the agricultural interests and their failure to operate any satisfactory system of eliminating bovine tuberculosis there is a strong case for granting permissive powers to urban areas above a certain size (for example, to cities and county boroughs) to require all the milk coming into their area, or produced and consumed in the area, to be either efficiently pasteurised or to be from herds certified free from tuberculosis and produced under cleanly conditions (Certified or Grade A (T.T.) milk).

The granting of such powers would need new legislation. Mere permissive powers of this kind alone are inadequate and the following are all conditions essential to efficient working of any scheme.

1. This permissive power should only be granted after inquiry by the Ministry of Health. The Ministry would have, for example, to prescribe a time limit to allow the trade to adjust itself to the new conditions. Also to be satisfied that the city staff was competent to control efficiently the pasteurisation plant within their area, and decide as to the control of pasteurisation plant outside the urban area. It would be necessary to prescribe certain conditions for plant, such as automatic temperature recorders not subject to unauthorised tampering.

2. The prohibition of all forms of heat treatment other than efficient pasteurisation for liquid milk coming into the urban area. Probably this could only be enforced after the expiration of a period of grace.

3. The simplification and encouragement of the production of clean milk from tuberculosis-free cows. The designated milk movement makes no real progress owing to many factors with which I have not space to deal. Simplification of nomenclature, unification of control, and veterinary assistance are all measures likely to assist this movement.

ITS ADVANTAGES.

I am of opinion that such a scheme of permissive compulsory pasteurisation for all milk in our large towns should be made legally operative. The main advantages are the following:—

(*a*) Some of our towns are keen and progressive as regards the quality of their milk-supply. These would be able to acquire valuable powers which would enable them to control and safeguard the milk supplied to their citizens. It has to be remembered that our large towns have *no* effective control over the milk supplied to them either as regards its general freedom from bacteria or as regards absence of tubercle bacilli. The powers they possess are almost entirely useless.

(*b*) The experience gained in the towns operating these powers would be invaluable both as to the efficient control of pasteurisation and as to the alleged advantages or disadvantages of the procedure. If found to be satisfactory it would be easy to extend these powers to areas of smaller size.

(*c*) It would mitigate the hardships of the smaller local dealers. Some would no doubt turn their attention to unpasteurised designated milks, others would probably be able to dispose of their milk outside the pasteurisation area. Some would no doubt sell to larger milk dealers with efficient plant.

(*d*) Great benefit would result from the obliteration, so far as these urban areas were concerned, of the present thoroughly bad system of heat treatment by inefficient methods and without any disclosure to the public of the fact. If the milk has to be transmitted any distance to a pasteurisation plant in an urban area it would have to be collected under reasonably clean conditions and adequately cooled. Of course, double pasteurisation would be prohibited. If the milk trade generally takes exception to this requirement it is as well to point out that their attitude has always been a denial of the fact that trade pasteurisation favours the utilisation of dirty milk. If this is a genuine standpoint there cannot be any hardship, for it is a scientific ascertained fact that reasonably clean milk well cooled will travel well and remain good amply long enough to convey it to any accessible urban area.

(*e*) The educational effect would be considerable, while the inhabitants of such an urban area would only be supplied with milk made safe by pasteurisation or safe because it was supplied from clean herds free from tuberculosis. I am, of course, aware that for the last group there are risks of conveying Brucella infection and possibly other infectious disease, but the risk is, I believe, a very small one.

Conclusion.

It is difficult to say if such a scheme would affect the price of milk in the area concerned. So much of the milk consumed in our large towns is now pasteurised that it should not make any difference. It may be suggested that the elimination of the smaller distributors will send up the price of milk. In practice, however, it is rare for the small-scale distributor to charge a lower price than his big competitors. He usually adapts his price to theirs, and if his costs are less, retains a larger margin of profit. Milk ought to be cheaper in the small towns with their own self-contained or adjacent milk supplies, but this is by no means always the case, and there does not seem to be any close relationship between the cost of handling and the retail price.

The medical profession is often urged to emphasise the need to drink more milk, and it is made a reproach that it does not do so. The milk trade fails to realise that it cannot do so with the present unsatisfactory conditions under which milk is produced and vended. Really safe milk is too dear and ordinary milk cannot win medical approval. A larger consumption of milk would be of great help to milk producers, while it would be of decided benefit to the health of the community if the consumption per head was increased. Under such a scheme as the above the medical profession could vocalise their desire for an increase in milk consumption in the area included, and that would incidentally help to reduce the cost and so the price of milk.

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ROYAL DEVON HOSPITAL: PROPOSED ENLARGEMENT.—The Royal Devon and Exeter Hospital is hoping shortly to enlarge and reconstruct its out-patients' department, to provide accommodation for mental cases, a dental department, and increased accommodation for maternity cases. Improved isolation wards are needed and better provision for waiting patients. The average cost at this institution per occupied bed was £131 11*s.* 4*d.* as against £128 8*s.* 8*d.* last year. The resources of the hospital continue to be severely taxed by the increasing number of motor accidents.

THE MEDICAL RESEARCH COUNCIL.

ANNUAL REPORT FOR 1929–30.

THE latest report[1] of the Medical Research Council opens with a discussion of the modern growth of medicine, which it sees as divided along two main paths. On the one hand, the sphere of medicine has extended to include more and more of the problems of human life that depend for their solution on a better knowledge of the form and workings of the human body. On the other hand, it has grown intensively by taking more and more fully into its service the methods and resources of the primary sciences. The Council has to try to give assistance in both branches of the work. Its report includes an account of research on the science of nutrition, the management of industrial life, the problems of deep diving and high flying, and the interplay of mind and body. Subjects depending closely on the ancillary sciences include radiology and radium therapy, the biological actions of light, chemotherapy, and filter-passing viruses. A factor which imposes heavy expense on the Council is the growing need for methods of precision in the measurement of new therapeutic agents—a work which requires intensive laboratory effort from the immunologist, the physiologist, and the biochemist, and which is all too apt to escape the recognition it deserves.

The Council has continued its policy of encouraging research on the clinical side and insists on the importance of posts for young clinical workers. There is a movement in this direction all over the country.

MATERNAL MORTALITY.

The Committee investigating puerperal fever presented an interim report during the year. It was found that out of nearly 1600 deaths directly attributable to childbearing, nearly 40 per cent. were due to septic infection, and nearly 20 per cent. to various types of toxæmia. The major problems of the toxæmias appear to belong to deep-seated chemical processes which are not yet fully understood. Work on puerperal fever has concentrated more and more on the streptococci; this research is in active progress and is already giving guidance towards prevention. The report points out that the problem of puerperal fever is only one ever-present example of our helplessness in the presence of acute blood-poisoning as the result of any infected wound. There is at present more hope in prevention than in cure. The Council look for great things from the removal of Queen Charlotte's Hospital to a better site, where a special block for septic cases has been equipped with suitable bacteriological and biochemical laboratories. Experience has already shown that the mortality is reduced some 50 per cent. if cases are aggregated in a suitable environment for special study by a whole-time worker.

NUTRITION AND VITAMINS.

The annual reports of the Council have for many years given an account of steady progress in nutritional problems. The work has now reached a stage which demands careful organisation and high expenditure and is therefore concentrated in a limited number of laboratories. Much work has recently been done upon vitamin A, and especially upon its function of enabling the individual to resist infection. Messrs. Lever Bros. have arranged that the whole supply of a concentrate prepared by them shall be placed at the disposal of the Council for scientific purposes, and the Royal Air Force personnel have submitted to a controlled test of the value of vitamin A in the prevention of colds and other winter ailments. The staff of the London County Council have coöperated in another inquiry, to ascertain the value of the vitamin in the treatment of infective middle-ear disease after scarlet fever and in the prevention of the sequelæ of various fevers.

The Dunn Nutritional Laboratory at Cambridge was opened during the year under review. Here work has been done on the correlation between pigment and the effects of vitamin A. It has been found, for instance, that the good effects are obtained when material from the yellow part of the pheasant's-eye narcissus is used, but not with the white part. No regular correlation could, however, be found in the animal fats that are rich in vitamin A, and for a time interest shifted away from carotene in this connexion. Recent work by Prof. Von Euler in Sweden has suggested strongly that carotene is a precursor of vitamin A in the animal body, and Mr. Thomas Moore, D.Sc., working at the Dunn Laboratory, has shown that carrot, though it contains no vitamin A, can give rise to the production in the animal body of as much vitamin A as that contained in an equivalent weight of cod-liver oil.

Much progress has been made in the standardisation of vitamins, and the unit of vitamin D has been defined as the antirachitic potency of a quantity of a standard solution of irradiated ergosterol corresponding to 0·0001 mg. of the ergosterol used in its production.

AMŒBIC DYSENTERY.

Details of a prolonged study of amœbic dysentery are now being published in full. It has been found that the entamœba infecting the macaque monkey is identical with the *E. histolytica* of man, and the investigator has obtained remarkable power of control over the parasite. It can be introduced at will into a fresh simian host and eradicated by therapeutic means. Host and parasite can be separated or united at will, and any desired experiment can be made with either or both combined. All the monkeys have been kept as personal pets and their vigour and contentment are famous.

ALCOHOL AND FERTILITY.

The well-known experiments of Prof. Stockard have been repeated with critical care. About nine years ago a small group of healthy guinea-pigs was chosen and the stock has been maintained by in-breeding. In each generation a number of animals of both sexes has been exposed to alcohol daily. The diet has been standardised and the offspring have been carefully weighed and examined. On no essential point has it been possible to find any confirmation of Prof. Stockard's views. The litters obtained from alcoholic parents and their descendants have been as numerous and heavy as those from the controls, and have shown no excess of still-births or deformities and no transmitted defects of the kind described by Stockard. The conclusions which have been based on Prof. Stockard's results cannot therefore be upheld.

INSULIN.

It would have been expected that the demand for insulin would rapidly rise to a peak, but in actual fact it has risen at a steady rate during the whole period of seven years since its introduction, and the conclusion seems to be inescapable that very many patients who needed the drug in 1925 were not getting

[1] H.M. Stationery Office. 1931. Pp. 138. 2*s.* 6*d.*

it. Moreover, the Council feels that even now the advantages of insulin treatment are not being afforded to all those who might benefit by it. It is also probable that many are not receiving it under proper conditions of biochemical control and dietetic balance, as there is a remarkable discrepancy between the success of insulin treatment in skilled hands and the static death-rate from diabetes in the country as a whole. The value of insulin is no longer open to challenge, but the death-rate calls for investigation. Even though insulin does not produce a cure and the death of the diabetic from any cause is likely to be certified as due to diabetes, there should yet be a steady decrease in the deaths from diabetes at early ages. This decrease does not reach the standard which the Council think it should in view of the value of insulin. The increasing mortality-rate among elderly diabetics indicates an absolute increase in the disease in this country. The Council propose during the coming year to inquire into the standard of success attainable under the best conditions.

MEDICINE AND THE LAW.

Punishment of the Insane.

THE Court of Appeal last week allowed an appeal in curious circumstances. Magistrates and judges, as is well known, may inflict a merely nominal punishment under the Probation of Offenders Act. Section 1 of the Act of 1907 names a number of grounds on which the conditional release of an offender may be permitted; one of these is the health or mental condition of the person charged. A person charged at Liverpool Assizes in 1929 pleaded guilty and was bound over in his own recognisances to be of good behaviour for two years and to remain in a mental institution until discharged therefrom. The judge had presumably taken into account the offender's mental condition as contemplated by the Act. Before, however, the offender entered into his recognisances, he was certified insane. He subsequently broke the condition of his recognisances by escaping from the institution. Thereupon, as contemplated by Section 6 of the 1907 Act, he was brought before the judge for failure to observe the condition, and he became liable to be sentenced for the original offence to which he had pleaded guilty at Liverpool. In these circumstances Mr. Justice Macnaghten passed a sentence on him of 10 months' imprisonment. On appeal the Court of Criminal Appeal has quashed the sentence on the ground that the certification of lunacy raised a presumption of insanity which prevented the recognisance from being binding; this presumption there had been no evidence to displace. The report of the case does not state whether certification took place before the plea of guilty. If those concerned were aware of the certification, there might have been a question of the accused's fitness to plead. But unfitness to plead is something more than certified lunacy. Moreover, the result of a finding that an accused person is unfit to plead may be indefinite confinement as a criminal lunatic; there is a natural tendency to shrink from this result. It will be noted that certification did no more than raise a presumption of insanity as regards the accused's capacity to enter into a binding contract in the matter of the recognisance. Even an insane person, confined in an asylum, is taken to be capable of making a valid will, if there is evidence of a lucid interval at the critical period or evidence that the insane delusions were irrelevant to the subject matter of the will.

On the general question of the punishment of the insane, the Atkin Committee (appointed after the respite of Ronald True's sentence in 1922) had much to say, especially in relation to cases where a verdict of guilty involves capital punishment. In this connexion there is interesting evidence given jointly by Sir John Anderson and Sir Ernley Blackwell on behalf of the Home Office before the Select Committee on Capital Punishment. The official view is that no person really insane is ever executed. Pressed with the suggestion that a murderer must be abnormal and "as nearly as possible insane," Sir John Anderson replied that such men are not so much abnormal as exceptionally wicked. "Why should a man who has no respect for human life be necessarily any more insane than a person who shows by his actions that he has no respect for property? There are lots of those people, and no one suggests they are insane."

A Chancery Judge's View of Insanity.

The notorious discrepancy between the medical and the legal views on the criminal responsibility of the insane needs no elaboration. Another recent case, in the Chancery Division of the High Court, illustrates the niceties of the legal view. In 1929 a man shot his wife and son dead and then immediately committed suicide. The verdict at the inquest was that he had murdered his wife and child, and had committed suicide while of unsound mind. The mother, who died intestate, had some small means; there was also a sum in the bank in the name of the son. A relative of the murdered woman claimed the estate. The claim was resisted by the administratrix of the suicide's estate. The claimant relied upon the rule that it was contrary to public policy that anyone should benefit by his own criminal act. The rule is that a murderer cannot claim any benefit under the will of the person he has murdered, and Mr. Justice Farwell would have been quite willing to apply the principle to the present case where there was no will but an intestacy. He came to the conclusion, however, that a man who had been an affectionate husband and father could not murder wife and son without some mental disturbance. The coroner's inquisition, said the judge, was not evidence on the question whether the husband was sane or insane. He himself must disregard the verdict of the coroner's jury when he approached that question. Basing his conclusion apparently upon no stronger foundation than the fact that an affectionate husband and father had killed his wife and son, Mr. Justice Farwell drew the inference that the man was insane at the time. If so, the man was not responsible for his actions, and his estate could not be deprived of benefit. According to the present law of property £1000 therefore goes to the husband's estate and the residue to the next of kin. By the usual legal presumption the son was deemed to have survived his mother and thus the father's estate took such money as the son possessed.

The significance of this case is that a High Court judge has taken a common-sense view rather than the rigid legal view about insanity. In effect the judge says that, if the man had not committed suicide but had been placed upon his trial for murder, the plea of insanity would rightly have succeeded. He forms this view rather upon a generalisation than upon the consideration of any such body of conflicting medical evidence as is usually placed before the court in such cases upon a trial for murder. He finds insanity where the coroner's jury found no insanity. He assumes,

doubtless, that a man does not suddenly become insane in the brief interval between murdering his family and committing suicide. In other words, one of His Majesty's judges has inclined towards the medical rather than the legal view.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

WHEN SHOULD ANTI-TETANUS SERUM BE GIVEN?

NOT long ago a doctor omitted to give a prophylactic injection of anti-tetanus serum to a person who died of tetanus. The price paid for this omission was a big sum in damages awarded against the doctor who, had he been wiser or more cynical, would have reasoned that an injection of anti-tetanus serum may be prophylactic in more senses than one. The problem, to inject or not to inject anti-tetanus serum as a precautionary measure, would seem to be quite insoluble if all parties concerned are to be satisfied. The doctor who argues that in any given case the chances of his patient developing tetanus are infinitesimal, and who accordingly holds his hand, may one day be obliged to pay terrific damages to the cost of which none of the hundreds of patients whom he has saved from the discomforts of anti-tetanus serum will contribute a single sou. On the other hand, the doctor in whose mind the above-mentioned damages loom heavily, and who gives prophylactic injections of anti-tetanus serum as a matter of routine whenever a patient comes to him with a scratch, is liable, sooner or later, to be accused by individuals and insurance companies of exploiting this measure to his own profit. *Que faire?* Is every doctor to be a law unto himself and decide every case on its own merits to the best of his judgment? Or should some corporate body lay down certain general rules behind which the practitioner may shelter, both from the claims of the relatives of the patient who has died for want of an injection, and from the aspersions of those who regard wholesale preventive inoculations as a device for increasing the doctor's income and the insured worker's leisure? These questions are not merely of local interest; they are common to every country where tetanus exists. In France the problem has become so burning that the Academy of Medicine, on the initiative of Prof. Hartmann, has appointed a commission composed of Profs. Hartmann, Balthazard, Auvray, Mauclaire, Gosset, Roux, J. L. Faure, Vaillard, Vallée, Bazy, and Walther to study it and to frame rules of conduct for the guidance and protection of practitioners. Such guidance is of course already to be found in text-books. But the protection an authoritative statement by the Academy of Medicine can give in this matter should prove effective, from whichever side the practitioner may be threatened.

THE SUMMER HOLIDAYS.

Another knotty problem which the Academy has lately been asked to unravel concerns the French school-child in the latter half of July. Is he or is he not to languish at his desk or face his examiners during a fortnight which is almost always hot and sultry? The overburdening of the school curriculum in France has lately attracted general attention, and the critical fortnight is only part of a bigger question. In presenting his report to the Academy on behalf of the Commission on the overloaded educational curriculum, Dr. Le Gendre pointed out that for years schools have broken up on or before August 1st, and that virtually the summer holidays already begin with the national fête of July 14th, only prizemen or examiners continuing to attend school. France having such a wide range of temperatures and climates, it might not, he thought, be fair to impose on the school-child grilling in Marseilles in July the same curriculum that might be bearable in Briançon, fanned by mountain breezes. Hence his suggestion to give education committees in different parts of the country a certain latitude in choosing the hours of work and rest for their scholars. The Commission has recommended the Academy to declare that the excessive temperature often experienced in the second fortnight in July, but sometimes occurring earlier, may hamper mental work and injure the health of the less resistant. The Academy is also invited to recommend a change in the scholastic time-table in excessively hot weather so that intellectual work is not done between 11 A.M. and 4 P.M. The daily application of cold water in some form or other is recommended.

BIRDS AS CARRIERS OF BRUCELLA.

On Feb. 10th a report was presented to the Academy by Dr. H. Violle who, in conjunction with Dr. Montus, has infected various species of birds with *Brucella abortus*. They were led to suspect birds as carriers of this germ by the observation that undulant fever sometimes occurs in human beings in areas where infection by the hitherto known sources can be definitely excluded. Intramuscular injections of brucella into three pigeons were followed by the death of one of them in three days. The two survivors were well when killed seven days after the injections, but the germ was recovered from the blood, heart, spleen, and liver of one of them. Of two chaffinches similarly inoculated, one died 48 hours later, its blood and spleen yielding a pure culture of brucella. The other, which was in good health, was killed a week after the inoculation, when its organs still contained brucella. Similar results were obtained with thrushes. The fact that birds, including migrants, may harbour brucella is the more significant as they are immune to quarantine regulations and sanitary cordons which sheep and goats may be forced to respect. Dr. Violle drew a rather alarming picture of the pigeon living in contact with manure infected with the urine of diseased sheep, goats, and cattle, and transmitting the infection to human beings either by direct contact with their soiled feet, or in the process of preparation for human food.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

HEALTH IN JAIL.

THE report on the prison administration of Burma for 1929 records health statistics "even less favourable than those of the previous year," thus drawing attention to the fact that Burmese prisons occupy an unenviable eminence in this respect. There are often unavoidable reasons for heavy morbidity- and mortality-rates in jails in particular areas. It would not be fair for instance to compare, without qualification, some fever-stricken districts in Bengal with the healthier parts of the Deccan, and epidemics or famine may account for an exceptional increase anywhere, but a comparison with most Indian provinces certainly shows the Burmese prisons in an unfavourable light. Mortality in Indian jails during 1929 varied between 8·1 per mille for the United Provinces

and 17 for Assam, as compared with 27·4 for Burma. The figure for Madras and Bombay is a little over 10 per mille, Bengal and the North-West Frontier Province in the neighbourhood of 12, the Central Provinces and Punjab between 13 and 14, and Bihar and Orissa 15·9. A disquieting feature is that the Burmese figures are not exceptional, judging by the record of the last five years. A frequent cause of uneasiness to superintendents of prisons is overcrowding, and it is obvious that the recent political disturbances must have thrown a great strain on the accommodation available in many areas. Burma, however, has been less affected than India proper by political disturbances, and although it is mentioned that a number of jails were not free from overcrowding during part of the year, additional accommodation for 1302 prisoners was provided, and the Inspector-General states that at the end of the period overcrowding had ceased to exist. That diet on the whole was sufficient and good in quality may be taken for granted, and the fact is confirmed by a reasonable average increase in weight of the prisoners. Water-supply is evidently a difficulty in certain of the prisons, and in some cases resort was had to chlorination. Conservancy, as in the great majority of up-country Indian prisons, is generally of the dry-earth type, and soakage pits for urine are in general use.

THE BURMESE JAIL POPULATION.

The daily average strength was 19,956. Of the 546 prisoners who died, 215 were admitted to jail in good health. Amongst causes of death dysentery comes first, with 1106 admissions and 145 deaths. Tuberculous diseases were responsible for 248 admissions and 134 deaths. Thus these two diseases accounted for more than half the total mortality. It was not a bad cholera year, and malaria, though there were a considerable number of admissions, was not a large cause of death (0·59 per mille). Burma, as a rice-eating country, is subject to beri-beri, but there were only 28 admissions for this disease, with one death. Some of the prisoners contracted beri-beri while detained in local lock-ups under trial. This shows the necessity of keeping a careful check on dieting under such conditions. There were 3440 admissions for ankylostoma infection, and seven deaths were attributed to this cause. It is recorded that 6·70 of the convict population were opium consumers. The prison at Bhamo returned the almost incredible percentage of 87·85 of opium addicts; but this habit is notoriously one of local prevalence. It is interesting to note that punishments show a large decrease for the year, and that the Borstal system, and other modern means of dealing with juvenile offenders, are receiving attention. The Salvation Army has made itself responsible for some juvenile adult criminals, and a prisoners' aid society is in operation in Rangoon.

BOMBAY JAIL MORTALITY.

The Bombay mortality figure of 10·3 per mille admits of little criticism from a sanitary or hygienic point of view; but even this figure is above that of the previous two years, for each of which the rate was only 8·6. The increase was due to the prevalence of influenza in part of the Deccan, and malaria following exceptional floods in Sind. The principal causes of death were pneumonia (33), pulmonary tuberculosis (17), dysentery (9), out of a total of 136 deaths for the year. The daily average strength was 13,204. There was no serious overcrowding. Prisoners' aid societies have been formed, and religious and moral instruction is given in many centres. An experiment with the boy scout movement has been started at a juvenile jail.

THE FIGURES IN ASSAM JAILS.

Although still high, the figures for Assam are considerably lower than in most of the last ten years. With a daily average of 2470 there were 42 deaths (17 per mille). Leaving out 1921, in which the mortality amounted to 35·4 per mille, and one or two other exceptionally bad years, there has been an almost continuous improvement. Here again the principal causes of death were dysentery (13) and tuberculosis (13). When special attention was directed to the water-supply at Sylhet it was found that the municipal arrangements for chlorination were defective; efficient chlorination in the jail resulted in a rapid diminution of cases. All Assam jails have now been ordered to chlorinate their water-supplies. Many of the tuberculosis cases were suffering from the disease on admission. Malaria only accounts for 113 admissions and one death, ankylostomiasis for 14 admissions. There is no prisoners' aid society in the province, and no mention is made of a Borstal institute, or other special provision for juveniles.

SUGGESTIONS FOR IMPROVEMENT.

No one can study reports of the average Indian jails without being impressed with the solid good work which has been put into these institutions, and the fact that from nearly every material point of view most of them continue to improve. It would be interesting however to observe the effect of a uniform chlorination of water-supplies. Water-borne disease still seems to bulk too largely in many mortality returns. As regards social and moral uplift there is perhaps more room for comment. Subject to the maintenance of discipline, nothing but good could result from the sort of amenities which have been introduced into some American and British prisons; such civilising privileges as books, music, lectures, and even plays might well be utilised to a greater extent than at present. The Indian prisoner is responsive to influences of this kind.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

THE CENSORSHIP BOARD AND SCIENTIFIC BOOKS.

UNTIL recently the Censorship Board of the Irish Free State, in its relations with books as distinct from periodicals, had dealt mainly with two classes of book—namely, modern fiction and works which advocate the unnatural prevention of conception. The latter class is prohibited specifically by the Act, and the Board has no duty except to decide that a certain work does as a matter of fact advocate such procedure, and the work is ipso facto prohibited on the report reaching the Minister. In regard to other works the prohibition of which they recommend the Censors must form the judgment that the work is obscene or indecent, and in coming to such judgment they must take into consideration the general tendency of the work. Opinions will differ about the propriety of their judgment in regard to many of the works condemned, such as, for example, Mr. Aldous Huxley's "Point Counterpoint," Mr. Sinclair Lewis's "Elmer Gantry," and Mr. A. P. Herbert's "Water Gypsies." But in the last list of books, the

circulation of which is forbidden in the Irish Free State, one finds a purely scientific study, Mr. Havelock Ellis's "Psychology of Sex." It is difficult to understand how any body of reasonable men can find such a book obscene or indecent in its general tendency. If such works are to be prohibited on such a ground there seems to be no limit to the meddlesome activities of the Censorship Board. It is true, of course, that it is within the power of the Minister for Justice to grant a permit to a student to import a book which is prohibited to the general public. One can see no justification, however, for placing unnecessary obstacles in the way of serious students, and it can hardly be denied that Mr. Ellis's studies are such as are necessary to all students of psychology and psychopathology.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

COÖPERATION OF HOSPITALS.

In the ninety-sixth annual report of the Glasgow Royal Maternity Hospital it is interesting to read that "as a result of recent legislation, hospitals maintained by the parish council have now passed into the control of the Corporation of Glasgow. The arrangements for sending cases to Stobhill Hospital to relieve the congestion in the wards has continued to work smoothly, and under the new régime beds in other municipal hospitals may now be utilised for this purpose. A further increase in the number of municipal beds available for the treatment of septic cases has enabled more satisfactory arrangements to be made with the medical officer of health for the removal of such cases from the hospital." The arrangement spoken of was made some years ago and has now developed into precisely the kind of coöperation that Sir John Gilmour, Secretary of State for Scotland, contemplated when the new Act was framed.

At the annual meeting of the directors of the hospital Prof. T. H. Bryce referred to the rapid extension of maternity services. Some 10,000 cases, he said, had been treated in the hospital last year, which was a considerable increase over 1929. For every woman who applied for admission in the old days, they now had four or five. They had provided for the care or the admission of all these patients and had not shut the door to a single person. This result would not, however, have been possible without the coöperation of the public health authorities and the public assistance committee.

THE RED CROSS.

Addressing the Edinburgh branch of the British Red Cross Society at its annual meeting Colonel Mackenzie, D.D.M.S. for the Scottish Command, raised the subject of a new military hospital for Edinburgh. The present one in the Castle is, he says, inadequate and unsatisfactory from many points of view. The War Office look with sympathy on the proposal to build a new hospital at Redford, where the Edinburgh garrison is stationed, but they cannot promise money at the moment.

The Voluntary Aid Detachment last year had a total of 268 members, of whom 120 were mobile, and also 48 probationers were undergoing training. They had several emergency calls for assistance from hospitals, and in each case this was given. In addition several members of the V.A.D. assisted at child welfare clinics.

THE UNMARRIED MOTHER.

At the annual meeting of the Edinburgh Home for Mothers and Infants the President (Harriet, Lady Findlay) said that during the year 38 girls were in residence and 27 babies. The average stay in the case of the girls was four months and the babies three months. The average age of the girls on admission was 21 years, but two girls of 13 and 14 years were admitted. Thirteen of the girls had been in domestic service; 10 had been living at home; two were factory workers; and five were in other employment. On leaving, 14 took up domestic work, 12 returned to their homes or friends, and two went to other homes. The training given to the younger girls in general housework proved valuable. Eleven babies were boarded with foster mothers, five went to homes for babies (four of the mothers taking service in the homes), and seven returned with their mothers to their own homes or friends. Happy family relationships had been established between the child and its own mother and the foster parents, but the finding of desirable homes was still a difficulty. The Home has done good work for many years and has maintained the policy of keeping the young mother and her child together as long as possible.

TREATMENT OF MENTAL DISORDERS.

In presenting the annual report of the Royal Edinburgh Hospital for Mental and Nervous Disorders Prof. G. M. Robertson, physician-superintendent, said that the progress made in the treatment of the sick in mind during the last quarter of a century had been amazing. It might be summed up in two words, "de-asylumisation" and "hospitalisation," developments in which Scotland had played a leading part. Certification was a cruel barrier to early treatment. Within the mental hospital emphasis must be placed on voluntary treatment as opposed to certification. The physicians of mental hospitals also could never fulfil their destiny of preserving mental health and of preventing mental disorder so long as they confined their efforts to intramural treatment. They must enter into the life of the community. The Jordanburn Hospital had been an old building, and to modernise it by new sanitation, central heating, electric lighting, a verandah for fresh air treatment, and a new entrance, cost £20,000. In addition the out-patient department cost £10,000; the endowment of a Chair of Psychiatry, £10,000; and the lecture theatre £8000. To purchase and fit up the clinic for the young cost an additional £2000. There was thus a total expenditure incurred during the last 12 years of £50,000. At the Mental Hospital itself, consisting of Craighouse and West House, the most notable change in the 12 years was the hospitalisation of the institutions. Some members of the Royal Commission appointed to inquire into the state of mental disorder in England could scarcely believe that the majority of their patients at the mental hospital came to them voluntarily. Yet such was the case. This gratifying result was mainly due to a realisation by the public of the fact that a mental illness was very much like a bodily illness, and that if taken in time and suitably treated recovery from it might be expected.

SHROPSHIRE ORTHOPÆDIC HOSPITAL.—The Shropshire county council have increased their contribution to the Shropshire Orthopædic Hospital from £700 to £1000 a year in consideration of the work the institution is doing for defective children of the county.

CORRESPONDENCE

IRRADIATION OF SCHOOL-CHILDREN.

To the Editor of THE LANCET.

SIR,—A paper by Sir Leonard Hill and Dr. A. R. Laurie, published in THE LANCET of Jan. 24th, deals with an experiment on school-children at Derby. An introductory section mentions the earlier experiment, carried out at a Willesden school by Dr. Dora Colebrook, and c mments unfavourably on some of its features. We know Sir Leonard Hill too well to suspect him of in ending the criticism of Dr. Colebrook which this tatement might easily be taken to imply. No m nion is made of the Medical Research Council' Committee on the Biological Action of Light, which promoted this experiment, accepted the report on its results, and unanimously recommended its publication. As fellow-members of that Committee with Sir Leonard Hill, it seems to us only just that the following facts should be made clear.

(1) The recommendations of an experiment on these lines, and of Dr. Colebrook as an investigator suitably qualified for its conduct, were made by Sir Leonard Hill to the Light Committee, who accepted the recommendations, and obtained from the Medical Research Council a suitable grant for the purpose.

(2) The Light Committee left the planning of the experiment to Sir Leonard Hill and his staff, in consultation with Dr. Colebrook. The source of the rays, the method of application and the dosage, were adopted by the Committee entirely on Sir Leonard Hill's recommendation, and the Committee understood that the installation and running of the lamps were under the supervision of his staff. We can understand that, after the experiment had been finished, and its negative results had been presented, doubts may have arisen in Sir Leonard's mind as to whether the radiation had been too severe, or too rich in short rays. If this was the case, the Light Committee, acting on Sir Leonard Hill's advice, were responsible for the defect, and not Dr. Colebrook.

(3) It appears to be suggested that Dr. Colebrook chose an unsuitable school. Our memories on this point agree, in suggesting that Dr. Colebrook, after many unsuccessful attempts to arrange the test in other neighbourhoods, brought the Willesden proposal before the Committee as one affording the coöperation she required from the authorities, and that the Committee accepted it. If similar facilities had been available in a "slum" school, it might indeed have given a greater chance of showing the beneficial effect of artificial radiation, on children whose natural exposure was obviously and notoriously deficient. According to our memories, again, this was *not* the object of the experiment. The Light Committee were not, in fact, concerned to make a case for the treatment by repeating the familiar demonstration of the equivalence of ultra-violet radiation to the administration of vitamin "D." The object of the experiment, in our view, was to test the claim that regular irradiation of parts of the body normally covered by clothes has the general effect of increasing bodily and mental vigour and resistance to infections, even in persons who are not suffering from any unusual defect of sunlight. For this purpose it seemed, and seems, to us that the Willesden scholars provided a suitable test-material. Assuming, however, that a wrong choice was made, and that ultra-violet radiation was thereby deprived of a proper chance of showing effects other than those due to vitamin "D," the mistake was made by the Committee of which Sir Leonard Hill was a member, and cannot fairly be laid to the charge of Dr. Colebrook.

(4) Dr. Colebrook had, accordingly, in our view no individual responsibility for the choice of the community to be treated, or for settling or controlling the details of the treatment. She had two important responsibilities other than these: (*a*) It was her duty so to organise the experiment that the children treated with the screened arc provided a good, scientific control for those exposed to the whole spectrum. (*b*) It was her duty to collect the resulting data, and herself to provide those needing skill in medical examination. We do not think that anybody will call in question the care, thoroughness, and scrupulous impartiality with which Dr. Colebrook did her share in organising the trial and collecting the results.

The above facts are as well known to Sir Leonard Hill as to ourselves. We are convinced that it is only by inadvertence that the statement, in his paper with Dr. Laurie, is so framed as to seem to impute to Dr. Colebrook alleged defects in the Willesden experiment. If they were indeed defects, the whole Committee ought to accept the blame for them, and Sir Leonard Hill himself a greater share than the other members.

We are, Sir, yours faithfully,

H. H. DALE.
S. R. DOUGLAS.

National Institute for Medical Research, Hampstead, N.W. 3, Feb. 25th, 1931.

VALUE OF RAMISECTION IN CASES OF SPASTIC WEAKNESS.

To the Editor of THE LANCET.

SIR,—The report on the value of ramisection in spastic weakness, signed by ten medical practitioners in Great Britain, and published in THE LANCET of July 19th, 1930, was of considerable interest to your readers in Australia and was the subject of a leading article in the *Medical Journal of Australia* of Oct. 11th, 1930. Dr. Royle's reply, published in your issue of Nov. 29th, has also received editorial notice in our pages.

My attention has been drawn by Dr. Royle to a letter from the pen of Mr. A. S. Blundell Bankart which appeared in THE LANCET of Dec. 13th, 1930. There is one point, and one point only, in Mr. Bankart's letter to which I wish to refer. Referring to Dr. Royle, Mr. Bankart states: "He starts badly by repudiating his one-time friend and colleague, J. I. Hunter, since he objects to our coupling the name of Hunter with his own." And again later: "Those who know the work of both men have little doubt that the operation of sympathetic ramisectomy would never have originated in Sydney without the help and inspiration of J. I. Hunter." That Mr. Bankart is mistaken is shown by the fact that in 1923, while J. I. Hunter was in Europe, Dr. Royle discussed with me in my office (I was then assistant editor of this journal) a new operation on the sympathetic nervous system that he was planning for the relief of spastic paralysis. Shortly after this Hunter returned from abroad and collaboration between him and Dr. Royle was begun. Thus the operation of ramisection did in fact originate

in Sydney "without the help and inspiration of J. I. Hunter."

Although the facts that I have stated are sufficient to determine the question at issue, I should like to mention two other points. In the first place, when Dr. Royle and J. I. Hunter submitted to the *Medical Journal of Australia* the two first papers on this subject, published on Jan. 26th, 1924, my late chief, Henry William Armit, regarded Hunter's paper as inordinately long and likely to create the impression that the part taken by the latter was more important than that taken by Dr. Royle. Armit sent for Hunter and put it to him that, since he had played merely a minor part in the investigations, his paper should be altered. I was present at the time. With Armit's suggestion Hunter concurred at once.

In the second place, I should like to quote a sentence from an article on John Hunter contributed to the *Sydney Morning Herald* of Dec. 19th, 1924, by Prof. Edgeworth David of the University of Sydney. Sir Edgeworth David wrote: "Hunter emphatically charged me that, whenever I might be speaking of the surgical cure of spastic paralysis (a discovery which has shed such lustre on the Medical School of the Sydney University) I should always give the credit for the discovery to the man who, he said, really deserved it, Dr. N. D. Royle, who, as is well known, initiated the experiments which have already achieved so marvellous a measure of success."

With the remainder of Mr. Bankart's letter I am not concerned in this place, for I have, as already stated, dealt with the subject in my own editorial columns.

I am, Sir, yours faithfully,

MERVYN ARCHDALL, M.D.,
Editor, The Medical Journal of Australia.

Sydney, Jan. 22nd, 1931.

DISSEMINATED SCLEROSIS.

To the Editor of THE LANCET.

SIR,—The recent refusal of Miss K. Chevassut to accept the offer of the Medical Research Council of an opportunity of demonstrating a spherule in disseminated sclerosis under her own test conditions in another London laboratory has led to Sir James Purves-Stewart dissociating himself from further collaboration with her.[1]

This, together with Miss Chevassut's negative findings in a test series of cases submitted to her for examination, under arrangements made by the Medical Research Council, might create the erroneous impression that a spherule is non-existent. We ourselves, however, working independently, although unable to confirm a number of Miss Chevassut's findings, have repeatedly observed a spherule in spinal fluids from disseminated sclerosis patients. We are therefore willing to demonstrate it to any medical colleague who so desires. We are not, however, prepared to say that this is the only nervous affection in which the appearance can be seen.

Whether the spherule will ultimately prove to be a living virus or due to some biochemical precipitation, we are not yet in a position to express an opinion. We are, however, continuing research on the subject, and hope to publish our further observations in due course.—We are, Sir, yours faithfully,

JOHN A. BRAXTON HICKS,
F. D. M. HOCKING.

Westminster Hospital Neurological Research Laboratory, Caxton-street, S.W., March 3rd, 1931.

[1] THE LANCET, Feb. 21st, 1931, p. 440.

DIET AND DIGESTION IN ASTHMA.

To the Editor of THE LANCET.

SIR,—Any medical man who goes thoroughly into every case of asthma which he sees must have noted that in many of them some evidence of dyspepsia can be found. The commonest symptom is flatulence or a sensation of fullness after meals. Patients will volunteer the information that an attack is produced after a heavy meal, or a meal containing certain articles of diet, or that certain food is harmless at breakfast, but harmful at night, and so on. In some people certain foods will produce rhinitis, which in an asthmatic is almost sure to be the forerunner of bronchospasm; other foods will produce urticaria, others again, such as excessive milk drinking combined with a mixed diet, will produce catarrhal conditions of the mucous membrane of the respiratory tract. It is important to realise that an exclusive milk diet does not produce the same result as a combined milk and mixed diet. The former is sound treatment, the latter is bad inasmuch as food incompletely digested produces catarrh.

Asthma is apt to occur at week-ends. A person working hard through the week regards Sunday as a day of rest. He rises late, has a late breakfast, and in two to three hours has his Sunday dinner—usually a heavy meal. He then falls asleep in a comfortable chair before the fire and in due course he wakes up with asthma, neither of his two meals having been digested. Another person enjoys his best meal of the day at 10 P.M. and is awakened with asthma at 2 to 4 A.M. The asthma in these types is due more to mechanical trouble than to the absorption of products of incomplete digestion. In these cases the stomach is distended with food and gas, which impede the free movement of the diaphragm, and this will inevitably produce spasm. Vomiting will immediately cut short such an attack. Many cases of this type are cured by simply correcting their habits.

The other type in whom inefficient digestion is chronic requires more attention. It is in this type that many of the manifestations of asthma are likely to be found, such as nasal catarrh, polypi, ethmoiditis, subsequent sinusitis, allergy, calcium deficiency, indicanuria, and most other symptoms which are stated from time to time to be the cause of asthma. The absorption of incompletely digested food products will produce practically all of these sequelæ, which will disappear with the more thorough digestion of the food, except of course in conditions such as polypi sinusitis or formed pus. Early nasal catarrh and mild ethmoiditis will improve and disappear. The aim of treatment is to allow of the food taken being completely broken down into its end-products before absorption.

In the early days of treatment it is often advisable to omit from the diet food which the patient knows from experience will produce discomfort. Meals should be taken dry; adequate water drinking between meals obviates thirst. Three meals are taken in the day with an interval of five hours between them, digestion of one being practically complete before the next is taken. The third meal, to be taken not later than 7 P.M., is chosen for its digestibility. Digestives are given, such as papain, combined with iridin and pepsin, but the preparation which I have found most efficacious is the panteric tablet, which dissolves in the alkaline secretions of the lower bowel; two tablets after each meal, although one is occasionally sufficient. This line of treatment,

together with a rational dietary, such as that advocated by Adam, of Glasgow, will usually produce marked improvement in the digestion within a week or ten days.

Milk is considered by many members of the medical profession to be a safe article of diet in health or sickness. But the so-called colds from which many children appear to suffer is nothing other than catarrh due to excessive milk drinking combined with ordinary food. If such a child be taken completely off milk this condition clears up in a week or two. The effect of this harmful diet in children is to produce an overgrowth of lymphoid tissue, and the production of enlarged tonsils, adenoids, and glandular weakness. The tissues become clogged with partly assimilated food. Whilst the condemnation of milk as part of the general diet may appear to be revolutionary, I would strongly urge those who have to treat cases of asthma to give serious consideration to this point, for whilst an asthmatic is taking large quantities of milk the result is apt to be very disappointing.

I am, Sir, yours faithfully,

F. T. HARRINGTON, M.R.C.S., L.R.C.P.

Newcastle-upon-Tyne, Feb. 20th, 1931.

PASTEURISATION OF MILK.

To the Editor of THE LANCET.

SIR,—The great weight carried by the signatories to the letter in your issue of Dec. 15th, 1930, undoubtedly makes one hesitate to question their views on pasteurisation, but I venture to suggest that there are important points to consider.

First, the question of vitamins. A short time back no one was aware of their existence; is it not possible that there are other vitamins or their equivalent half-sisters existing in milk? Some changed state in milk there certainly is after it has been pasteurised; the difference can be sensed by nose and tongue, and it will go sour much quicker than sound unpasteurised milk. Granted that drinking pasteurised milk may cause no apparent harm during adolescence, may it not be the precursor of certain phases of later disease such as premature caries.

Secondly, the method of pasteurisation, for the milk must be evenly heated, not overheated in one place and underheated in another. It is questioned by many whether pasteurisation as carried out commercially does completely sterilise the tubercle bacillus. Diseased milk is contaminated either from the cow or from man. The main dangers from the cow arise either from bovine tuberculosis, mastitis, or contagious abortion. The danger of undulant fever from the last named is still, I believe, a matter on which the medical mind is open.

One would have thought that the causative bacteria of bovine mastitis (excluding T.B.) conveyed by milk would be a frequent source of disease in man, considering that herds of milk-cattle on farms are rarely free from mastitis either in the acute or chronic form. The commoner bacilli of bovine mastitis include both staphylococci and streptococci, and of the latter both the hæmolytic and non-hæmolytic varieties. Although these may sound formidable sources of trouble, it can be confidently asserted that cocci which are pathogenic to cows' udders are non-pathogenic to man. The only danger would arise when the udder infection was of human origin.

I believe that the pasteurisation or non-pasteurisation of milk requires further consideration. Would it not be more helpful to endeavour to improve the quality of milk at its source, in a way similar to that in which our water supply is treated, rather than to endeavour to clean milk, already bacteriologically dirty, by pasteurisation? I have been informed on good authority that some of the victims of the recent outbreak of septic poisoning, traced to milk as the vehicle, were regular drinkers of so-called pasteurised milk.

I am, Sir, yours faithfully,

Feb. 28th, 1931. WILLIAM S. STEVENS, M.R.C.V.S.

ANÆSTHESIA IN CHILDBIRTH.

To the Editor of THE LANCET.

SIR,—The decision (mentioned on p. 495 of your last issue) of the Central Public Health Committee of the London County Council to give effect to my plea made on Nov. 25th "that light anæsthesia should be provided in hospitals under the Council's control" marks a quite radical change of policy for cases of normal labour. I wish to distinguish very clearly, as I did at the Committee, between *general* anæsthesia and *light* anæsthesia. The amount required to enable the mother "to use her pains," as the midwives tell her, is very small. In many middle-class patients it is self-administered in emergency and allows the patient to be fully conscious between the pains. Its administration should eventually be possible by a trained nurse.

I am, Sir, yours faithfully,

Chiswick, Feb. 27th, 1931. STELLA CHURCHILL.

SEX DETERMINATION.

To the Editor of THE LANCET.

SIR,—May I give the details of a case I have recently attended. The woman who had previously had two children, a boy and a girl, had a normal menstrual period starting on March 6th, 1930, which lasted (as usual) seven days. She had intercourse with her husband on March 28th, the only time for several months, neither was there any after. She had an abortive period (one day only) on April 3rd, the day she had expected it to appear, and she gave birth to a 7 lb. male child on Feb. 21st, 1931. The length of gestation from the date of intercourse was 330 days—i.e., 47 weeks and one day. Intercourse took place during the maximum girl time period according to Lady Erskine. This woman's other two children were each born about a month late according to the ordinary calculation from the beginning of the last menstrual period. In neither case were they post-mature: one weighed 5¾, the other 6¾ lb. I am, Sir, yours faithfully,

Redhill, Feb. 25th, 1931. L. J. BARFORD, M.D.

CHEMICAL IMPROVERS IN BREAD-BAKING.

To the Editor of THE LANCET.

SIR,—According to our Food Act no person shall sell to the prejudice of the purchaser an article of food which is not of the nature, not of the substance, and not of the quality demanded by the purchaser. On referring to a leading article which appeared in THE LANCET of March 19th, 1927 (p. 609) dealing with the report of the Departmental Committee on the Treatment of Flour with Chemical Substances one reads:—

"There are bakers, the Committee state, who wish to know the nature of the materials they are using, and who want flour and not a mixture of flour with something else."

As bearing upon this question let me quote from a

letter which I received from the general secretary of the Operative Bakers, Confectioners and Allied Workers. His lament is "unfortunately we were unable to produce any proof that the use of chemical improvers was injurious to the consumer." Here the question of injury to the consumer so far as the baker is concerned is entirely irrelevant. The baker clearly has the right to demand and to have "flour and not a mixture of flour with something else."

That bread made of flour with which so-called chemical improvers have been incorporated is far from wholesome there cannot be a doubt. The crust is usually tough and leathery, difficult to cut and difficult to chew, and the interior is doughy and badly baked. As a matter of fact, and quite apart from the untoward chemical changes produced directly by the so-called chemical improvers themselves, the bread baked under such circumstances is not easy of digestion; an article of food partaken of daily for any length of time which is more or less indigestible is bound, sooner or later, to be a cause of ill-health. On medico-scientific grounds alone it is incumbent upon our Minister of Health, in the interest of the health of the people and especially of the children, to prohibit forthwith the use of so-called chemical improvers in flour for bread-baking.—I am, Sir, yours faithfully,

JAMES OLIVER, M.D., F.R.S. Edin.

Harley-street, W., Feb. 24th, 1931.

CEREBRO-SPINAL FEVER.

To the Editor of THE LANCET.

SIR,—I am glad to see that Dr. M. H. Gordon has pointed out the considerable evidence which exists as to the value of type sera in the treatment of cerebro-spinal fever. Those who had to deal with these cases in the Army are well aware of the great advance in the treatment which was rendered possible by Dr. Gordon's researches and the typing of the organisms which became a systematic procedure. It is, therefore, lamentable that at the present time type sera are not available in this country either for diagnostic or for treatment purposes. It is to be hoped that the Ministry of Health and the Medical Research Council will speedily see that the same facilities are available for the civilian population as were available during the war for the Army.

With regard to Dr. J. A. Glover's comments, there appears in them to be some confusion between temporary and chronic carriers. I think there is very little doubt that the discovery of chronic carriers in an institution is of great importance. Dr. Glover's remarks appear to refer chiefly to multiple cases scattered throughout barracks or institutions. Where, however, the cases are localised to one portion of an institution, the investigation of carriers is of considerable importance and the general hygienic measures mentioned by Dr. Glover, if solely relied upon, will not necessarily remove the risk of further cases occurring. I have had, for instance, lately an instance of two cases in a single hospital ward in an institution; in this case obviously the investigation of single possible carriers was of the greatest importance, the general hygienic measures as mentioned by Dr. Glover being already in force. Dr. Glover has not mentioned the possibility of immunisation with a vaccine against the meningococcus, and I am inclined to think that in large institutions with multiple cases occurring in various parts of the institution this means of defence will eventually prove to be the most valuable.—I am, Sir, yours faithfully,

A. H. G. BURTON,
Medical Officer of Health, Ilford.

Public Health Offices, Ilford, March 3rd, 1931.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 21ST, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 250 (last week 221); scarlet fever, 1629; diphtheria, 1231; enteric fever, 114; pneumonia, 2501; puerperal fever, 60; puerperal pyrexia, 111; cerebro-spinal fever, 78 (last week 52); acute poliomyelitis, 1; acute polio-encephalitis, 1; encephalitis lethargica, 12; dysentery, 36; ophthalmia neonatorum, 71. No case of cholera, plague, or typhus fever was notified during the week.

The 78 cases of cerebro-spinal fever were notified from the following 20 counties: London, 5; Chester, 1 (Birkenhead); Derby, 2 (Buxton and Chesterfield R.D.); Durham, 1 (Houghton-le-Spring R.D.); Essex, 2 (East Ham); Kent, 1 (Gillingham); Lancaster, 3 (Liverpool 1, Chorley R.D. 2); Leicester, 1 (Blaby R.D.); Middlesex, 3 (Tottenham, Uxbridge, and Hendon R.D.); Northumberland, 4 (Newcastle 2, Newbiggin-by-the-Sea 1, Wallsend 1); Oxford, 1 (County Borough); Southampton, 4 (Portsmouth 3, Aldershot 1); Suffolk East, 1 (Ipswich); Surrey, 2 (Croydon and Frimley); Sussex East, 2 (Brighton); Warwick, 1 (Birmingham); Yorks West Riding, 41 (Barnsley 2, Rotherham 1, Sheffield 1, Adwick-le-Street 1, Birstal 1, Bolton-upon-Dearne 1, Greasbrough 1, Hemsworth 4, Maltby 7, Rawmarsh 1, Shelley 1, Swinton 1, Thurnscoe 1, Wath-upon-Dearne 1, Worsborough 1, Doncaster R.D. 2, Hemsworth R.D. 10, Thorne R.D. 4); Caernarvon, 1 (Llandudno); Glamorgan, 1 (Cardiff); Monmouth, 1 (St. Mellons R.D.).

Of the 114 cases of enteric fever 91 were reported from the county of Essex, distributed as follows: Chingford, 1; Epping, 72; Ilford, Leyton, Romford each 1, Walthamstow, 8; Woodford, 1; Epping R.D., 6.

The number of cases in the Infectious Hospitals of the London County Council on Feb. 24th–25th was as follows: Small-pox, 219 under treatment, 5 under observation (last week 190 and 7 respectively); scarlet fever, 1477; diphtheria, 1923; enteric fever, 237; measles, 122; whooping-cough, 332; puerperal fever, 32 (plus 17 babies); encephalitis lethargica, 120; poliomyelitis, 1; "other diseases," 149.

Deaths.—In the aggregate of great towns, including London, there was 1 (0) death from small-pox, 1 (0) from enteric fever, 97 (2) from measles, 8 (2) from scarlet fever, 44 (12) from whooping-cough, 48 (11) from diphtheria, 55 (9) from diarrhœa and enteritis under two years, and 509 (106) from influenza. The figures in parentheses are those for London itself. Seven deaths from meningococcal meningitis occurred in London—four under 1 year, two from 2–5 years, and one from 55–65 years.

The death provisionally classified to small-pox was assigned to Leicester C.B. The fatal case of enteric fever outside London occurred at Hull. Twenty-five fatal cases of measles were reported from Liverpool, 15 from Newcastle-on-Tyne, 11 from Birmingham, 7 from Hull, and 5 from Sunderland. Portsmouth reported 3 deaths from whooping-cough. Diphtheria claimed 12 victims at Liverpool, 3 at Hull. The 403 fatal cases of influenza outside London are scattered over 88 great towns: 24 were reported from Manchester, 19 from West Ham, 18 from Birmingham, 13 each from Bolton and Preston, 12 from Cardiff, 10 each from Swindon, Hull, Gateshead, and Newcastle-on-Tyne, 8 each from Plymouth, Liverpool, Bradford, Sheffield, and Darlington, 7 each from Nottingham, Middlesbrough, Rhondda, and Swansea, 6 from East Ham.

The number of stillbirths notified during the week was 315 (corresponding to a rate of 47 per 1000 births), including 59 in London.

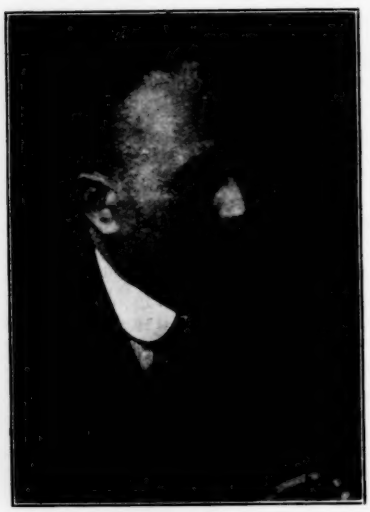
DEATH FROM VARIOLA MINOR IN LEICESTER.

THIS was a female infant, aged 10 days, born on Feb. 4th, apparently healthy. A small-pox eruption appeared on the 11th, and by the following day the child was thickly covered. Some of the spots were hæmorrhagic; the child passed blood per rectum, and died in a convulsion on the 14th. Dr. C. Killick Millard, medical officer of health for the city, who sends us this information, remarks that the child must have been infected in utero. Previous cases of minor small-pox had occurred in this house, traceable to an overlooked case, and the mother herself developed the eruption two days before confinement, having had slight symptoms of malaise a few days previously. It is of interest to note, Dr. Millard adds, that this is only the second death from variola minor which has occurred in Leicester since 1904—i.e., 27 years ago. The other death occurred early last year in a baby 3 weeks old (see THE LANCET, 1930, i., 357).

OBITUARY

ALBERT HENRY BYGOTT, M.D. Lond.

THE death of Dr. Bygott on Feb. 21st in his 63rd year at his home in Bury St. Edmunds means the loss of an outstanding personality in the public health service. His early struggles as a medical student are known only to his contemporaries who learned to admire his endurance under privation, his dogged perseverance, and his capacity for self-denial. Matriculating in 1887 he studied at Queen's College, Birmingham, and St. Mary's Hospital, London, qualifying L.S.A. in 1893, when he at once commenced practice in Birmingham. His natural genius in medicine and in surgery were quickly recognised and he was the idol of his poor patients. In those days hospital accommodation was much more limited than now, and Bygott achieved extraordinary things in the way of urgent operations in poor homes. On the top of the work of a heavy practice he piled continuous study and he obtained the M.B. Lond. in 1900, and in the following year when the Birmingham guardians turned their poor-law medical staff into a whole-time service he accepted the position of district medical officer for the Bordesley district. In the quieter atmosphere of an official appointment Dr. Bygott soon made short work of the completion of his academic ambitions, taking the M.D. Lond. in 1902, the D.P.H. (Birmingham) in 1903, and becoming a barrister of the Middle Temple in 1905.



DR. BYGOTT.

[Photograph by Jarman.

His real sphere was obviously preventive medicine, and he seized the opportunity to enter the public health service when his friend Dr. R. A. Lyster, who had recently been appointed Hampshire's first medical officer of health, invited him in 1908 to become assistant county officer. Bygott threw himself whole-heartedly into the task of introducing medical inspection into the schools and progressive public health ideals into a county where organised medical work of any description was previously unknown. Teachers all over the county still remember the striking personality of the new school doctor, his tactful ways of overcoming difficulties and opposition. Subsequent promotion was rapid. He was appointed medical officer of health to Barking in 1909, and moved from there in 1912 to become county medical officer for West Suffolk, a position he occupied until his death. For these 18 years Dr. Bygott took a catholic interest in everything which even bordered on health and hygiene and one scheme after another in the county came to life under his vigilant eye. His interest in child welfare was especially keen, and the lectures which he gave to mothers were always well attended. He took up the orthopædic scheme promoted by the county education authority, and it was largely due to his enthusiasm that many children with defective limbs were enabled to become self-reliant citizens. He had a share in outlining the scheme for dental treatment which resulted in the appointment of a county dentist. It was characteristic of him that he was never content with any concession which he obtained, using it merely as a stepping-stone to further advance. He was always critical of the facilities for in-patient and out-patient institutional treatment and never lost an opportunity, as a member of the advisory committee to the Labour party, of emphasising the need for improved organisation of medical services in the county. To his clinical colleagues he stressed the conception of the hospital as the centre of the medical life of the area, and his suggestions for the better utilisation of the services of the junior members of teaching school hospitals claimed respectful hearing. He specially deplored the lack of interest in the child of school age, recalling his own experience as school medical officer when ascertaining that only 5 per cent. of the children found defective on medical inspection had been taken to a medical man for treatment. In the years immediately following the war, realising the practitioner's difficulty in getting away from duty, he endeavoured to arrange a scheme of exchange during the summer months between practitioners in town and rural districts. While work in the country needed no recommendation, he thought, to the town practitioner, he emphasised the fact that the country practitioner might engage in some form of post-graduate study, while his wife would find many things of interest in a busy town.

Dr. Lyster writes: "There is no doubt that Bygott continuously overworked. He loved his work so much that he could not bear to let anyone do things for him, and he delegated grudgingly. He had found for years that his capacity for work and endurance was unlimited and that he could dispense with relaxations, and hobbies, and holidays, and he made the fatal mistake of thinking that he could go on indefinitely. Two years ago he had an attack of what was then diagnosed as influenza but was really encephalitis and he never recovered. He could not contemplate life without his beloved work, and so the advice of his friends who implored him to retire, and to try the effect of prolonged rest and change, fell on deaf ears. His work was his life, and when he found his chances of holding on to his work were fading away his life ended.

"A man of the highest courage, physical, mental, and moral, he could always face an issue calmly and fearlessly. Few realised what a lovable man hid behind that shy, sensitive, and abrupt manner, but to those who were privileged to share his friendship Bygott was a beloved companion whose instincts were generous and whose capacity as a loyal and devoted comrade was endless."

Dr. Bygott married in 1901 and his widow survives him.

ARTHUR LAMBERT, M.D. Camb.

THE death of Dr. Arthur Lambert, in his home at Harrow-on-the-Hill, came as an unexpected shock to both school and town. He died just as he was about to start on his round on Feb. 12th.

Sydney Herbert Arthur Lambert was born in 1867

at Georgetown, Demerara, British Guiana. Educated there at Queen's College under Exley Percival, an able old Etonian, he won the Colonial Scholarship, and went to St. John's College, Cambridge, in 1884. He took the natural sciences tripos in 1887, studied medicine at St. Mary's Hospital, and qualified with conjoint and Cambridge degrees in 1892 and 1893. He became house physician at the Brompton Hospital, and thereafter took a short travelling holiday. In 1894 he settled down to work at Harrow, where he remained until his death. He joined the firm of Briggs and Bindloss in 1894 as assistant, and in 1896 as partner. In 1916, when Dr. Bindloss retired from the practice, Dr. Lambert became senior partner and medical adviser to the Headmaster of Harrow. In this capacity he was mainly responsible for the health of the school, besides having a growing practice outside. His fine powers were tested severely during the influenza epidemic of 1918, when, almost alone in Harrow, save for one assistant, he had to cope with the illness of 400 boys in the school, a large proportion of the school staff, and innumerable cases in the town. Accommodation was insufficient and nurses were not to be had, yet only one boy in the school died. "For years," writes a colleague, "it had been Lambert's ambition to have a new and adequate sanatorium for the growing needs of the school; and when at last, only a year ago, the new sanatorium on Sudbury Hill was opened, he said, 'Now I shall die happy.' The school was as much to him as he to the school. As a practitioner he had a quick eye for the finer points of diagnosis, and was gifted with that medical instinct which only comes as the reward of knowledge and experience. He was, indeed, the very finest type of practitioner; he gave freely of his skill and personal sympathy to rich and poor alike. His life was one of unbroken service, which he loved to give; the work had become so much part of himself that he literally feared the day when he should have to withdraw from practice. His patients were all his friends; to many he was their best friend. So appreciative of the troubles and difficulties of others, you would think he never had any of his own; so simple and unassuming, one hardly knew how big a man he was till he was gone. In a busy practice for 36 years, he never lost touch with the progress of medicine, but always kept in contact with the best medical and surgical opinion and practice. Laziness, meanness, or avarice he simply did not understand; always believing the best of human nature, he called forth the best in everyone."

Dr. Lambert married in 1899 Edith, daughter of the Rev. W. Orde Newnham, and she survives him.

PANEL AND CONTRACT PRACTICE

Changing the Doctor.

IN the House of Commons last week Mr. Gossling asked the Minister of Health whether the recent change in the medical benefit regulations by which insured persons must give longer notice of their wish to transfer from one insurance doctor to another was made with the approval of the British Medical Association. Miss Lawrence (Parliamentary Secretary to the Ministry of Health), in reply, stated that the appropriate steps were taken to bring this proposal to the notice of the Association as soon as the Minister had formed the opinion that any further protection of insurance funds which could be secured by this means ought to be secured without avoidable delay. The whole subject was fully discussed at the annual conference of local medical and panel committees in October, and a resolution was passed requesting the Minister to defer the consideration of the matter for a year. The Minister was sensible of the importance which attached to the principle of free choice of insurance doctors by insured persons, but complete freedom of choice was not accorded by the regulation which had now been amended. The matter was therefore, Miss Lawrence concluded, one of degree, and the Minister had decided that it was his duty to take action without interposition of any prolonged period of delay such as had been suggested to him on behalf of the Association.

Fitness for Marriage.

A doctor asked the Worcestershire Insurance Committee at its last sitting for advice in the following matter. A curious point, he wrote, has come before me. A panel patient comes to me who is "sure he is perfectly well" but wants me to examine him thoroughly because he has "become engaged to be married." Does this come within the scope of general practitioner service under the Acts? The writer went on to say that he always encouraged repeated medical examinations of an insured person when in sound health, but he foresaw that the demand for certificates of fitness for marriage might render panel practice almost impossible to carry out. Can we charge a fee for such examination, he asked, and if so what fee? The insurance committee being in doubt what to reply referred the matter to the local medical and panel committee which discussed it fully and passed the following resolution:

> The panel committee are of opinion that to give a decision as to whether a patient is fit for marriage would, in the majority of cases, involve examinations which can be conducted only by specialists, and as such services are outside the scope of medical benefit, the panel committee consider that the question of such an examination should be left to the discretion of the insurance doctor who is consulted.

The point is one that is likely to arise in other areas.

"A Modern Jeremiad."

Dr. Leslie Trotter (Ledbury, Herefordshire) writes: "The anonymous practitioner referred to in your issue of Feb. 21st (p. 442) is too sweeping in his condemnation of the panel system. Though I do not suppose any panel doctor would try to maintain that the system was perfect, I think most would agree that it is a very great advance upon any contract system that was in existence before. I cannot speak for conditions in industrial districts, having had only a very brief experience of them soon after the Insurance Act of 1911 came into force; but as regards this rural district it has always seemed to me that with a reasonable amount of goodwill on both sides—doctor and patient—the system has worked fairly satisfactorily. Of course, panel patients seek advice more often than private ones; but that is only human nature, and is to be expected. It is—in my opinion—a distinct advantage in many cases for patients to seek advice early, as panel patients do, for it is easier to get them right quickly. With regard to the oft-repeated complaint about the limitation in one's scope in prescribing expensive drugs, it does not appear to have struck some doctors that there are certain private patients who can ill

afford these drugs. Why should semi-charity patients (panel patients only bear a portion of the cost of the system) be in a more advantageous position than private patients, and get any drugs ordered however costly? On the whole, I think panel patients are often far better off than private ones, for the doctor has not got the unpleasant feeling that they are thinking all the time of the cost of visits, and goes more often in consequence. On the whole, I find about here that panel patients are considerate, and do not fetch one out at night unnecessarily. I have never experienced any of the suspicion and ill-feeling referred to in the above-mentioned article. Perhaps I have been abnormally fortunate, though I doubt it."

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

HARDSHIPS OF PENSIONERS.

THE MINISTER'S DEFENCE OF HIS POLICY.

ON a supplementary vote for salaries and expenses, taken on Feb. 26th, Mr. F. O. ROBERTS (Minister of Pensions) said that they had under-estimated the staff required. They had had to carry out heavy work in connexion with the investigation of claims for disablement made by ex-officers and men more than seven years after their discharge from service in the Great War. The weight of this extra work had fallen mainly on the current year, since the new arrangements were not in full working order until March. This work involved not only the retention, and even increase of local medical staff, but also the retention of clerical and administrative staff at headquarters which would have been dispensed with. In the second place they had to complete the review of cases on the conditional and temporary pension list in order to carry out what had been frequently urged both by himself and his predecessor—namely, the achievement of a permanent settlement of as many cases as possible. This work also had involved a heavy call on the medical and clerical staff, both centrally and locally, and had inevitably tended to keep up their numbers. During the current financial year the Ministry would probably have admitted to pension about 1000 cases, or provided for them in some other form by way of gratuity or allowance. Some portion of this compensation was included in this estimate. A more potent cause of the increased expenditure had been the normal review of cases on the conditional list, including cases in which deterioration of his condition and an increase in pension was claimed by the officer or man, and cases in which, on other grounds, an increase of pension was found to be proper. There was also an item of £55,000, representing increased expenditure on artificial limbs and surgical appliances. To an appreciable extent this increase was due to a change of accounting, but in the main it was due to the fact that artificial limbs and appliances issued some years ago were now coming in in increasing numbers for renewal or repair.

CRITICISMS OF MINISTERIAL POLICY.

Mr. MACPHERSON said that the Minister had not told them as much as he would like to know about how the limbless soldiers were being treated. He would like to know if the Government were satisfied that these men were being made as comfortable as possible with the most up-to-date limbs on the market. The Minister had said nothing about final awards. These were important. There was nothing more tragic than to see men dragged up time after time when they could ill spare the time and the special expense to appear before medical boards. Ex-Service men were sick of medical boards. One thing ex-Service men did appreciate were final awards.

Major COHEN said that the seven years' limit was an extremely unfortunate measure for the majority of ex-Service men. Only 800 of 14,500 cases which were outside that limit had been admitted to pension. The Ministry had set up, as an added safeguard, a committee of expert medical men to whom doubtful cases would be submitted. During the period of 11 months from November, 1929, he (Major Cohen) understood that 156 cases had been before the committee, 136 had been considered, and only 21 allowed. He would like to know more about the working of this expert committee.

Mr. R. RICHARDSON asked the Minister to consider whether justice was being done to the widows of men who had had pensions until their death, but whose widows received no allowance. He urged that medical practitioners who had professionally attended deceased ex-Service pensioners for years should be allowed to attend the tribunal and give evidence in support of the widow's claim, instead of merely sending in certificates. That would make all the difference in the hearing of such cases.

THE SHERLOCK HOLMES ATTITUDE.

Mr. STEPHEN said he hoped that the Minister would take advantage of the fact that the expenditure of his department was naturally contracting as the years went on to make more effective the principle that the benefit of the doubt should be given to pensions claimants. If that principle were carried out they would not find that only 800 were given pensions out of 14,000 cases. He was convinced that nine-tenths of the cases which he had gone into personally and submitted to medical friends should have been granted. He hoped that as a result of that debate the medical advisers of the Ministry would understand that their old line of approach to this question had been wrong, and that it was not the function of a medical officer to become a Sherlock Holmes, and to try to trace some flaw in the cases which came before them. It was the business of those officers to be kindly and to see if there was anything which would justify the granting of a pension.

Mr. HASLAM suggested to the Minister that he should employ local medical men whenever possible. Hon. Members might be rather unjust in the complaints that they had made about the medical advisers to the Ministry, and in endeavouring to fix on them the blame for a lack of justice. The medical men concerned were the servants of the Ministry, and the responsibility must be on the Minister who defended them in that House. To go behind the Minister and blame the medical men was not altogether just. He joined, however, in the request which had been made to the Minister to see that pensions claims were considered in a sympathetic spirit, and that an attempt should be made to assist the very hard position in which some of these men were placed to-day.

AN ATTACK ON THE MEDICAL OFFICERS.

Mr. MAXTON said that in spite of what Mr. Haslam had said about the medical officers being the servants of the Ministry, he was afraid that they must place the responsibility on the medical men. The political head of the department must be guided by the opinion of his medical advisers, but it seemed to him that in certain groups of cases the medical men were taking a very harsh and indefensible view. He had had to bring cases of rheumatoid arthritis before several pensions Ministers. The medical officers of the department said that this disease was not attributable to or aggravated by war service. Medical friends of his own informed him that the causes of rheumatoid arthritis were extremely obscure, and that the medical profession did not know them. But they said that to be found in a completely helpless condition at the age of 45 because of the advanced

state of this disease was most unusual in the case of men who had lived an ordinary decent life. On the other hand, when he went to the doctors of the Ministry of Pensions he was told "It is true that the medical profession does not know what causes rheumatoid arthritis; but we are perfectly certain that war service had nothing to do with it." He could not understand that, and he hoped that in the absence of exact scientific knowledge on this subject the Minister would say to his medical officers: "While I always defer to your opinion where there is real medical knowledge, yet where there is admittedly only complete medical ignorance I shall have to rely on my own judgment and decide that the very serious condition of these men has been at least aggravated by the war." He wished to know if the abolition of the Bellahouston Pensions Hospital at Glasgow was now complete and if the patients were being sent for treatment in the ordinary wards of the Royal Infirmary, and to the Erskine House Hospital? Was that arrangement working satisfactorily and without too great inconvenience to the men; and did it result in economy?

STEREOTYPED RULES.

Colonel HOWARD-BURY said that he had listened with great sympathy to Mr. Maxton's speech because he had had cases of rheumatism brought to him. Rheumatism might not appear for some years after exposure to such conditions as those of the trenches during the war. Yet many times the Ministry of Pensions had turned cases down because they said that the rheumatism had come on since the war and could not be attributable to military service as the men were perfectly fit when they were discharged. In December last, the Minister stated that 20,300 fresh war pensions had been submitted outside the seven years' limit, and of those rather more than 18,000 had been considered, but only in 982 cases had the claims been recognised by way of medical or surgical treatment, or by way of some pecuniary compensation. Probably there was a certain number of poor cases amongst them, but he felt sure that the vast majority were real cases. They had been investigated beforehand by the area committees, and the number of claims admitted was a very small proportion indeed of those which ought to have been admitted. After 10 or 12 years' experience the Ministry seemed to be working in a stereotyped fashion. It was all rules and regulations and red tape, and that was why they so often found themselves tied hand and foot.

THE MINISTER'S REPLY.

Mr. ROBERTS, replying to the debate, said that he could assure the committee that specialists were working satisfactorily and with justice. He was satisfied that it was wise to adopt this form of procedure. The cases referred to specialists by war pensions committees were 341 up to the end of January, 1931, and the cases referred as a result of other action were 43, or a total of 384. Of these 384 cases, 338 had been dealt with a follows: Accepted on the advice of an independent specialist, 48; rejected on the same advice, 290. The Ministry always tried to supply ex-Service men with the best type of artificial limbs it was possible to obtain. With regard to the references which had been made during the debate to medical officers, he (Mr. Roberts) felt compelled to express the appreciation which he had of the work done by the medical side of the Ministry. He knew the medical officers were in a very difficult position, but despite what had been said that day the medical officers gave to their work a consideration which must be appreciated by those who knew it best. His medical officers desired to give the best service they could. The cases were considered on their merits. If anyone could prove to him that there was a doctor working for the Ministry who was not working in accordance with the standards which they had a right to expect from members of that profession, the Government would be the first to take steps to dispense with his services, but he had a right to defend the medical officers so far as the complaints which had been made that day. If the Government accepted the proposals that had been put forward they would find pensions administration drifting into a state of chaos from which it would be almost impossible to extricate it. No Sherlock Holmes inquiries were made, but only those which were necessary to substantiate a claim. With regard to Mr. Maxton's question he (Mr. Roberts) hoped to be able to go to Scotland himself to see how the pensions administration was working there.

PERCENTAGE DISABILITY.

Dr. MORRIS-JONES raised the question of percentage disability pensions. He said he could see no reason why the officials or the medical men representing the Ministry should ask such men whether they were in work. At one time a standard was set for tuberculosis sufferers according to which they were paid the full amount of disability pension. If the sputum was tubercular-positive and there were definite signs in the lungs that was considered sufficient. That was not the case now, but the standard was a very fair one.

YARMOUTH NAVAL HOSPITAL BILL.

On Wednesday, Feb. 25th, in the House of Lords, the Yarmouth Naval Hospital Bill was presented by Lord Amulree and read a first time. This Bill provides for the reception and detention of certain patients of unsound mind at the Royal Naval Hospital at Great Yarmouth and for the treatment therein of certain voluntary patients.

INDUSTRIAL STRIKES AND HEALTH SERVICES.

On Thursday, Feb. 26th, the Standing Committee of the House of Commons, which is considering the Trade Disputes and Trade Unions (Amendment) Bill, discussed an important amendment moved by Members of the Liberal party, which would make illegal any strike or lock out of which the effect at any time, by reason of its extension or continuance, was to expose the community or any substantial portion of the community, to danger to health or safety by interfering with the supplies or distribution of essential food, water, fuel, light, medical or sanitary services, or other necessities of life. Mr. Hayday, who is the Chairman of the Trade Union Congress, stated that those for whom he spoke could not accept the Bill if the amendment were carried. Sir WILLIAM JOWITT (the Attorney-General) said that the amendment was intended to wreck the Bill. He objected to it in principle, and he objected to the words because they made impossible a strike that might be wholly industrial and in which the men might be absolutely in the right, and would drive men back to work on the employers' terms. The Government considered that the amendment put the trade unions in a far worse position than the Act of 1927, and actually in a worse position than had been known since 1875. Under no circumstances could the amendment be accepted. The position in his view was that on the one hand the Government had the clear and fundamental duty to protect the community as a whole, by using their powers under the Emergency Powers Act, and on the other they had to regard the elementary right of a man, if he so desired peaceably to withold his labour, either alone or in combination with others. After considerable discussion the amendment was carried by 37 votes to 31—majority against the Government, 6.

Later the Bill was withdrawn.

HOUSE OF COMMONS.

WEDNESDAY, FEB. 25TH.

Medical Research in India.

Major GRAHAM POLE asked the Secretary for India the present position in the matter of the proposed establishment of an all-India medical research institute.—Mr. WEDGWOOD BENN replied: In March, 1930, I sent my hon.

friend a copy of a debate in the Legislative Assembly which showed that the Government of India had then decided to summon a Conference to inquire into the most suitable centre for the proposed central medical research institute and other matters. This conference was held in July and passed a resolution (the official Members not voting) that a central medical research institute on the lines advocated by the Fletcher Committee should be located at a University centre as soon as financial conditions permitted. The Government of India are considering this resolution, but anticipate that it will not be possible to bring the institute into existence either at Dehra Dun or elsewhere so long as the present financial stringency continues.

Royal Veterinary College.

Sir GEORGE COURTHOPE asked the Minister of Agriculture whether a grant would be available from the Development Fund towards the cost of reconstructing the Royal Veterinary College; upon what conditions it would be made; whether any further grant would be available from other funds; and whether he was aware that in the event of the total sum required being unobtainable the college would not be able to continue its educational work.—Dr. ADDISON replied: The Treasury have sanctioned grants from the Development Fund amounting in all to £150,000, provided that the Governors obtain from other sources a sum of £100,000. Other conditions are attached to these grants, and I shall be happy to supply the hon. Baronet with a statement of them if he so desires; but they raise no difficulty, and have been accepted by the Governors. The hon. Baronet is no doubt aware that the Governors have themselves raised a sum, which I understand is now slightly above £50,000. I can only add that I am well aware of the difficulties of the College.

Proposed Facilities for Doctors' Cars.

Mr. HORE-BELISHA asked the Minister of Transport whether, in view of the urgent nature of calls made on doctors, he would consider allowing a distinctive sounding horn on their cars, as in the case of ambulances, so that the police in control of traffic would be enabled to afford them special facilities for proceeding on their way.—Mr. H. MORRISON replied: Fire engines and ambulances are vehicles which are readily recognisable, and both the police and the general public do what they can to facilitate their expeditious passage when answering a summons. There is no distinction in appearance, however, between a doctor's car and an ordinary private car; and I should deprecate any attempt to establish a priority of right of way by the use of a distinctive type of motor horn or any other similar means, as such a course would be open to serious abuse.

THURSDAY, FEB. 26TH.

Nursery Schools.

Mr. FREEMAN asked the President of the Board of Education the present number of nursery schools established; which were open-air schools; and what was the total number of children in attendance; and whether he would publish a list of authorities who had taken advantage of their powers in providing nursery schools.—Mr. MORGAN JONES (Parliamentary Secretary to the Board of Education) replied: There are 44 recognised nursery schools in England and Wales, of which 34 are open-air schools, while nearly all the others have good open-air facilities. My right hon. friend is unable to state the actual numbers in attendance at these schools, but altogether they provide accommodation for 3076 children. A new edition will shortly be published of the Board's list 42, which gives the names of recognised nursery schools and shows which of them are provided by local education authorities. I am sending my hon. friend a list of those authorities which have taken steps to provide such schools.

Mental Condition of Two Boys.

Mr. LOVAT-FRASER asked the Minister of Health if his attention had been called to the case of Ivor Clifford Thompson and Ronald James Thompson, of Milford Haven, who, after a conviction for stealing a bicycle, were committed to a mental institution as mentally deficient; and if he would inquire into the mental condition of the boys.—Mr. GREENWOOD replied: The two persons named were undergoing detention in Swansea Prison where they were certified by two qualified medical practitioners to be feeble-minded, but owing to the inability of the local authority to provide institutional accommodation or appropriate guardianship, they have not been dealt with under the Mental Deficiency Act.

Ministry of Health Journal.

Mr. SIMON asked the Minister of Health whether he would consider the desirability of publishing a Ministry of Health Journal on the analogy of the Board of Trade Journal and the Ministry of Labour Gazette.—Mr. GREENWOOD replied: This question has been considered from time to time, but I am not satisfied that the value of such a journal as the hon. Member has in mind would be sufficient to justify at the present time the additional labour and expenditure which it would entail.

National Health Insurance.

Mr. GOULD asked the Minister of Health the number of persons whose health insurance membership had been continued for another year as a result of the passing of the National Health Insurance (Prolongation of Insurance) Act, 1930.—Mr. GREENWOOD replied: Precise figures on this matter are not available, but in the Memorandum explaining the financial resolution on the Bill it was stated that it was estimated that between 60,000 and 100,000 persons would have their period of insurance extended as a result of the Bill.

Pasteurisation of Milk and Paratyphoid.

Mr. GRAHAM WHITE asked the Minister of Health whether he was making any arrangement to insure the efficacy of the pasteurisation methods used for the milk-supply of the country, with a view to reducing the number of cases of paratyphoid fever.—Mr. GREENWOOD replied: I am advised that the paratyphoid organism is easily destroyed by heat, and that any of the methods of treatment by heat in general use, if carried out with proper care, is effective in destroying this organism. Milk is not allowed to be sold as "pasteurised" unless it has been treated by the method prescribed by my department, and as this method is now being used to an increasing extent, I do not think it is necessary for me to take any special steps to encourage its adoption.

Paratyphoid in Essex.

Colonel HOWARD-BURY asked the Minister of Health whether the origin of the outbreak of typhoid in Essex had been discovered; how may cases had occurred; how many have proved fatal; and what steps were being taken to prevent a further outbreak. Mr. GREENWOOD replied: The inquiries made by a medical officer of my department, in conjunction with the local medical officers of health, appear to have shown that the origin of this outbreak of paratyphoid was one of the employees at a dairy farm who, unknown to himself, was suffering from the disease. 256 cases (including secondary cases) have occurred up to the present and there have been seven deaths. The preventive measures which were taken included the removal to hospital of the man considered to have been the source of infection, the cleansing and disinfection of the premises, milk utensils, &c., and the employment of a fresh staff of workers at the farm.

Pure Milk.

Mr. HURD asked the Minister of Health if he had considered the suggestion submitted to him that in order to encourage the supply of pure milk the Ministry should abolish the licence fees now demanded from producers who applied for permission to sell Certified or Grade A milk; and if he would adopt this suggestion.—Mr. GREENWOOD replied: I am not at present satisfied that the abolition of the licence fees for graded milk would have any appreciable effect upon the supply; but I will consider the matter in consultation with my right hon. friends, the Chancellor of the Exchequer and the Minister of Agriculture, and also with representatives of local authorities when opportunity occurs for the general revision of the Special Designations Order.

Vaccination and Small-pox.

Mr. CARTER asked the Minister of Health whether, in view of the conclusion arrived at in the recent report of the Rolleston Committee on Vaccination in regard to the necessity of trying to find some means of protecting against small-pox other than that of the direct introduction of a living virus into the organism, he would introduce a Bill at an early date to suspend the compulsory clauses of the Vaccination Acts, as had been done in Holland, until the experimental researches now in hand had been completed, particularly in view of the continued occurrence of deaths from post-vaccinal encephalitis after the use of Government lymph.—Mr. GREENWOOD replied: I have under consideration the whole subject of vaccination, but I cannot in present circumstances undertake to introduce legislation dealing with this question. I may point out that the compulsory requirements of the Vaccination Acts are in effect limited to infants under 12 months of age, and that in this class the occurrence of post-vaccinal encephalitis has been practically negligible, whereas I understand that in Holland the compulsory measure which has been suspended related to the vaccination of children at school age. I may add that since 1st Jan., 1930, a total of seven cases of post-vaccinal encephalitis have been reported, two of which have proved fatal.

MONDAY, MARCH 2ND.

Indian Medical Service.

Major GRAHAM POLE asked the Secretary for India whether it was proposed to make any alteration in the method of recruitment to the Indian Medical Service pending the enactment of constitutional reforms.—Mr. WEDGWOOD BENN replied: Not so far as can be foreseen at present.

Supply of Quinine in India.

Major GRAHAM POLE asked the Secretary for India the present position in the matter of the consultations between the Government of India and the Provincial Governments on the question of centralising the whole subject of cinchona cultivation and the manufacture and distribution of quinine, as suggested by the Royal Commission on Agriculture in India, as a first step towards the reduction of the price of quinine in India to a level at which it would be possible to embark on an extensive anti-malaria campaign.—Mr. WEDGWOOD BENN replied: The Government of Madras have expressed their agreement with the recommendations of the Royal Commission and their willingness to transfer their plantations and factory to the Government of India. The Government of Bengal wish to retain their plantations and factory in their own hands, and consider that in any case no change should be made until the future constitution of the Central and Provincial Governments has been settled. In the case of Burma no action can, of course, be taken, at least for the present, in view of the recommendation of the Round Table Conference in favour of the separation of Burma. I am sending my hon. friend a copy of the report recently received from the Government of India.

New Red Cross Convention.

Lieut.-Colonel FREMANTLE asked the Secretary for Foreign Affairs, whether, seeing that on July 27th, 1929, there were signed by representatives of Great Britain, the Dominions, and India one convention relative to the treatment of prisoners of war, and a new Geneva convention for the amelioration of the condition of the wounded and sick of armies in the field, he would say why these conventions had not been presented to Parliament with a view to ratification.—Mr. DALTON (Under Secretary for Foreign Affairs) replied: A number of legal questions have had to be examined in connexion with these two Conventions, one of which will require legislation to bring it into effect. The Conventions will be laid before Parliament very shortly.

TUESDAY, MARCH 3RD.

Deaths in Childbirth.

Mr. FREEMAN asked the Minister of Health the number of women who had died in childbirth each year since the war; what percentage of these deaths were estimated to be preventable; whether he had any information showing the number who received no prenatal supervision; and what was the proportion of deaths compared to those who did receive assistance—Miss LAWRENCE (Parliamentary Secretary to the Ministry of Health) replied: The following statement shows the numbers of women in England and Wales who have died in childbirth attributed to pregnancy and childbearing in each of the years 1919 to 1929 inclusive: 1919, 3028; 1920, 4144; 1921, 3322; 1922, 2971; 1923, 2892; 1924, 2847; 1925, 2900; 1926, 2860; 1927, 2690; 1928, 2920; 1929, 2787. The figures for 1930 are not yet available.

My right hon. friend is advised that no reliable estimate can be formed of the proportion of maternal deaths in these years which were preventable, but he may point out that in their recent report the Departmental Committee on Maternal Mortality estimated that of the deaths brought under their notice, which they had no reason to suppose were other than fairly representative of the total, not less than one-half were preventable. No information is available in regard to the last two parts of the question, but the Departmental Committee record their opinion that while the number of women who receive antenatal supervision is increasing, there is still a large section of the population which does not realise the advantages of such supervision.

MEDICAL NEWS

Society of Apothecaries of London.

At recent examinations the following candidates were successful:—

Surgery.—J. M. Durr, Guy's Hosp.; J. H. Ferguson, Universities of Oxford and Harvard; J. S. Lane, Guy's Hosp.; and G. S. Rozario, King's Coll. Hosp.

Medicine.—C. L. Ferguson, University of Cambridge and London Hosp.; J. H. Ferguson, Universities of Oxford and Harvard; J. S. Lane, Guy's Hosp.; and R. Pakenham Walsh, University of Oxford and St. Mary's Hosp.

Forensic Medicine.—J. H. Ferguson, Universities of Oxford and Harvard; E. I. B. Hawes, St. George's Hosp.; W. G. Kingston, Middlesex Hosp.; S. E. Paterson, Edinburgh; R. Schauder, King's Coll. Hosp.; and C. F. Williamson, University of Birmingham.

Midwifery.—R. R. Clipstein, St. Mary's Hosp.; J. H. Ferguson, Universities of Oxford and Harvard; D. R. Rigg, University of Sheffield; and G. S. Rozario, King's Coll. Hosp.

The following candidates have been granted the Diploma of the Society entitling them to practise Medicine, Surgery, and Midwifery: C. L. Ferguson, J. H. Ferguson, and G. S. Rozario.

Oxford Ophthalmological Congress.

This Congress will meet at Keble College, Oxford, from July 8th-11th. The morning of the 9th will be devoted to the Diagnosis of Intracranial New Growths, when the speakers will be Mr. Leslie Paton, Sir Percy Sargent, Dr. H. M. Traquair, Mr. Norman Dott, and Prof. Artur Schüller (Vienna). In the afternoon Prof. G. Elliot Smith, F.R.S., will give an address on the Evolution of the Instruments of Vision. The Doyne memorial lecture will be delivered on the 10th by Mr. P. E. H. Adams, Margaret Ogilvie reader in ophthalmology in the University of Oxford. The other arrangements include an address by Prof. Bailliart (Paris) on Tonometry, and a discussion on Penetrating Wounds of the Eyeball, introduced by Mr. James Craig and Prof. Schüller. The hon. secretary of the Congress is Mr. C. G. Russ Wood, 12, St. John's-hill, Shrewsbury.

Instruction for the D.P.M.

The London County Council have published a syllabus of numerous courses now beginning at the Maudsley Hospital, Denmark Hill, S.E.5, and other hospitals for candidates for the Diploma in Psychological Medicine. Inquiries may be addressed to the director of the central pathological laboratory at the hospital.

University of London.

At a meeting of the Senate on Feb. 25th Mr. H. L. Eason, M.S., was reappointed to represent the University on the General Medical Council. It was resolved to institute a University (part-time) chair of medical psychology tenable at the London School of Hygiene and Tropical Medicine.

University of Edinburgh.

The Cameron prize for 1931 has been awarded to Madame Curie.

London Temperance Hospital.

It is announced that this hospital has received a gift of £32,000 from Mr. Samuel Insull, of Chicago, whose parents were formerly interested in its work.

Birmingham's Children's Hospital.

Pressure upon the accommodation last year was acute, and on Nov. 17th last there were 906 surgical cases awaiting admission; 823 of these were for tonsil and adenoid treatment in the day ward, for whom appointments had been given running into February, 1931. Owing to the prolonged industrial depression a large number of the patients were "definitely malnourished." The total number admitted to the general wards was 3001. A nurses' home containing 110 bedrooms, and the other usual accommodation is to be built at a cost of £41,000.

Hospital Extensions.

St. James's Hospital, Balham, is to be enlarged by the London County Council at an estimated cost of £137,380.—The centenary of Huddersfield Royal Hospital is to be marked by the erection and equipment of a new wing. It is proposed to provide a new casualty ward, a dispensary, a patients' waiting-room to seat 300, a self-contained unit for eye, ear, and throat patients, children's sections, &c. There will also be a radiological department, and the total cost is expected to be £90,000.—Lord Derby recently laid the foundation-stone of a new out-patients' department of Bootle General Hospital. The cost is expected to be £25,000.—Mr. F. H. Fox, the chairman, has formally opened a new wing of Wellington (Somerset) cottage hospital. The enlargement includes a private ward, a women's ward of eight beds, and additional domestic accommodation.

"Silver Paper" Valueless.

In view of the deterioration of tin-foil used for wrapping purposes and the consequent fall in value Aberdeen Royal Infirmary has discontinued its collection.

Workmen's Contributions to Mexborough Hospital.

At the annual meeting of this hospital it was stated that more than 75 per cent. of the income (£13,348) was contributed last year by work-people.

British Charities Association.

The amount contributed to hospitals by this association last year amounted to £27,634. Since its inception in 1923 distributions have been made to over 900 hospitals, £101,228 going to those in the London area and £100,486 to those outside.

Croydon Hospital Saturday Fund.

The sum of £4650 has been raised as the result of the efforts of the Croydon Hospital Saturday Fund. This is a record result.

York Hospital Sunday Fund.

The total balance of receipts of this fund for last year were £456 as against £502 in the previous year. There is a decrease of £45 in the church collections.

Glasgow Hospital for Sick Children.

This institution last year treated 5247 in-patients, and there were 23,468 out-patient attendances. It is proposed to create a completely equipped orthopædic organisation consisting of local clinics at suitable points in and around Glasgow and in the centre and west of Scotland; the hospital itself would be in direct association with the local clinics.

Hospital Costs.

Last year the in-patients (4450) of Bradford Royal Infirmary cost an average of £8 2*s.* 11*d.*, a decrease of 14*s.* The average cost of each occupied bed was £137 2*s.* 4*d.*, more than £6 less than in 1929. The average weekly cost of an in-patient was £2 17*s.* 7*d.*—At King Edward Memorial Hospital, Ealing, the weekly cost per in-patient was £3 1*s.* 10½*d.*, a fractional increase.—In the adjoining borough of Acton the in-patients (1304) cost £3 3*s.* 6*d.* per week, as against £3 16*s.* 6*d.* in the preceding year; the average stay was 15·1 days, against 13·88.—At the West Norfolk and King's Lynn Hospital there were 2042 in-patients whose daily average cost was 9*s.* 3*d*; their average stay was 11·4 days.

Maternity Hospitals.

Last year the Glasgow Royal Maternity and Women's Hospital treated about 10,000 cases, a large increase upon the previous 12 months.—Lady Camden recently opened the new Tunbridge Wells and District Maternity Home in Culverley Park Gardens, which has cost £6000. It will accommodate 25 mothers; last year there were 168 patients.—Councillor Miss M. E. Royle, chairman of the Willesden district council, recently opened a maternity hospital of 26 beds at Kingsbury standing in ten acres of grounds. The building, which has been entirely transformed, was formerly a small-pox hospital.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Capt. C. T. Baxter is placed on the retd. list.

Surg. Lts. E. B. Pollard and J. C. Souter to be Surg. Lt.-Comdrs.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Sub-Lt. W. H. C. Watson to be Surg. Sub-Lt.

ROYAL ARMY MEDICAL CORPS.

W. A. Robinson to be Lt. (on prob.) and is secd. under the provisions of Art. 205, Royal Warrant for Pay and Promotion, 1926.

ARMY RESERVE OF OFFICERS.

Lt.-Col. W. Byam to be Lt.-Col.

Capt. H. B. Walker, from Supp. Res. of Off., to be Capt.

TERRITORIAL ARMY.

Maj. J. Walker to be Lt.-Col.

R. G. Karn (late Essex R.) and J. J. Myles to be Lts.

ROYAL AIR FORCE.

Dental Branch: Flying Officer M. J. Pigott is granted a non-permanent commission in this rank.

INDIAN MEDICAL SERVICE.

Capt. E. Benjamin relinquishes his temp. commn.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, March 9th.—5 P.M., UNITED SERVICES. Discussion Minor Head Injuries. Opener: Squadron-Leader: H. L. Burton. Other speakers will take part.

TUESDAY.—8.30 P.M., PSYCHIATRY. Joint Meeting with the Society for the Study of Inebriety. Discussion: The Prevention and Treatment of Drug Addiction. Openers: Dr. E. Mapother and Dr. F. C. Laughton Scott (Psychiatry); Dr. William Brown and Dr. Macdonald Critchley (Society for the Study of Inebriety).

WEDNESDAY.—5 P.M., SURGERY: SUB-SECTION OF PROCTOLOGY. Discussion: Ulcerative Colitis Excluding Tropical Diseases. Openers: Dr. Francis R. Fraser (Medicine), Dr. Cuthbert E. Dukes (Pathology), Mr. J. P. Lockhart-Mummery (Surgery). Other speakers: Dr. F. J. Poynton, Dr. Arthur F. Hurst, Dr. H. Letheby Tidy, Dr. Kerr Russell (Medicine), Dr. L. P. Garrod (Pathology), Dr. H. Graham Hodgson (Radiology), Sir Charles Gordon-Watson (Surgery). Members of the Sections of Medicine, Pathology, and Surgery are specially invited to take part in the discussion.

THURSDAY.—8.30 P.M., NEUROLOGY. Cinematographic Demonstrations: Dr. Stanley Barnes: A Case of Unusual Dissociation of Voluntary Eye Movement. Dr. Henry Cohen: Technique and Results of Encephalography and Ventriculography. Short Communications: Mr. O. Gayer Morgan and Dr. C. P. Symonds: Unilateral Ophthalmoplegia with Absent Tendon Jerks. Dr. Russell Brain: Grasp Reflex in the Foot.

FRIDAY.—5.30 P.M., CLINICAL. (Cases at 4.30 P.M.) Cases and Specimens: Mr. Cecil P. G. Wakeley: Generalised Neuro-fibromatosis. Dr. Bernard Myers: Essential Thrombocytopenic Purpura Hæmorrhagica. Dr. E. Stolkind: Polycythæmia Vera with Cerebral Thrombosis. Polycythæmia Vera with Nervous and Ocular Disorders. Dr. M. A. Cassidy: Post-mortem Specimens of Case (shown on Oct. 10th) of Abdominal Carcinomatosis with Probable Adrenal Involvement. Dr. Geoffrey Konstam: Vascular Spasm in a Female aged 15. Dr. F. Parkes Weber and Dr. M. Scholtz: Splenic Enlargement in Simple Achlorhydric Anæmia (L. J. Witts). Other cases and specimens will be shown. 5 P.M., OPHTHALMOLOGY. Clinical Meeting at the Middlesex Hospital, W. Tea at 4.30 P.M. Cases will be shown.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, March 9th.—8.30 P.M., Lord Dawson: Treatment of Pneumonia. Discussion.

SOCIETY FOR THE STUDY OF INEBRIETY.

TUESDAY, March 10th (see under Royal Society of Medicine).

WEST KENT MEDICO-CHIRURGICAL SOCIETY, Miller General Hospital, Greenwich, S.E.

FRIDAY, March 13th.—8.45 P.M., Dr. J. Forest Smith: Treatment of Goitre in General Practice.

PADDINGTON MEDICAL SOCIETY.

TUESDAY, March 10th.—9 P.M. (at the Great Western Royal Hotel, Paddington), Sir John Collie: Medico-legal Pitfalls.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY, 11, Chandos-street, Cavendish-square, W.

THURSDAY, March 12th.—8.30 P.M., Dr. Robinson: Organ Jargon.

BIOCHEMICAL SOCIETY.

FRIDAY, March 13th.—3 P.M. (at University College, Gower-street, W.C.) Annual General Meeting. Communications.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.

MONDAY, March 9th.—5 P.M., Mr. E. C. Shattock: Specimens Illustrating Diseases of the Colon and Rectum.

FRIDAY.—5 P.M., Sir Arthur Keith: Specimens Illustrating the Anatomy, Physiology, and Pathology of the Œsophagus.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

TUESDAY, March 10th.—5 P.M., Dr. Macdonald Critchley: The Neurology of Old Age. (First Goulstonian Lecture.)

THURSDAY.—5 P.M. (Second Goulstonian Lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, March 9th, to SATURDAY, March 14th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square. Mon., at 4 P.M., Free lecture by Dr. B. T. Parsons-Smith: Early Diagnosis of Myocardial Insufficiency.—PRINCE OF WALES'S HOSPITAL, Tottenham, N. Tues., Free demonstration in the Wards by Dr. Browning Alexander at 2.30 P.M.—ST. MARY'S HOSPITAL, Paddington, W. Free demonstration in General Surgery by Mr. Zachary Cope on Thurs., at 11 A.M.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Special Course in Medicine, Surgery, and Gynæcology for three weeks occupying afternoons and some mornings.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, Great Portland-street, W. Special Course in Orthopædics for two weeks, occupying mornings and afternoons.—WEST END HOSPITAL FOR NERVOUS DISEASES, Welbeck-street, W. Special Course of lecture-demonstrations in Diseases of the Nervous System. Daily at 5 P.M.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Special Course in Dermatology. Every afternoon.—Further particulars from the Fellowship of Medicine.

ROYAL INSTITUTION, 21, Albemarle-street, W.

TUESDAY, March 10th.—5.15 P.M., Mr. C. D. Darlington: Cytological Theory of Heredity.

THURSDAY.—5.15 P.M., Prof. J. B. S. Haldane: Respiration.

SATURDAY.—3 P.M., Lord Rutherford: Alpha Rays.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, March 9th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat, and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Children's Diseases Clinics. Operations.

WEST LONDON POST-GRADUATE COLLEGE, Hammersmith-road, W.

MONDAY, March 9th.—10 A.M., Gynæcological Ward, Genito-Urinary Operations, Skin Department. 11 A.M., Surgical Ward Visit. 2 P.M., Surgical Ward Visits. Operations, Medical, Surgical, Eye, and Gynæcological Out-patients.

TUESDAY.—9.30 A.M., Operations. 10 A.M., Medical Ward Visit, Dental Department. 11 A.M., Throat Operations. 11.30 A.M., Surgical Demonstration. 2 P.M., Operations, Medical, Surgical, and Throat Out-patients.

WEDNESDAY.—10 A.M., Medical Ward Visit, Children's Medical Out-patients. 2 P.M., Operations, Medical, Surgical, and Eye Out-patients. 4.45 P.M., Venereal Diseases Demonstrated.

THURSDAY.—10 A.M., Neurological Department. 11.30 A.M., Fracture Demonstration. 2 P.M., Medical, Surgical, Genito-Urinary, and Eye Out-patients. 2.30 P.M., Operations.

FRIDAY.—10 A.M., Medical Ward Visit, Dental Department, Skin Department. 12 noon, Medical Lecture. 2 P.M., Operations, Medical, Surgical, and Throat Out-patients.

SATURDAY.—9 A.M., Throat Operations. 10 A.M., Medical Ward Visit, Children's Medical Out-patients, Surgical Out-patients.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.

THURSDAY, March 12th.—9 P.M., Dr. G. Hodgson: Value of X Rays in General Practice.

CHARING CROSS HOSPITAL MEDICAL SCHOOL, Agar-street, W.C.

SUNDAY, March 8th.—10.30 A.M., Dr. J. E. M. Wigley: Diagnosis and Treatment of Common Skin Diseases. 11.45 A.M., Dr. A. A. W. Petrie: Early Mental Symptoms and Their Treatment.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, University-street, W.C.

TUESDAY, March 10th.—5.15 P.M., Dr. E. W. Hurst: Disseminated Encephalomyelitis following the Exanthemata.

WEDNESDAY.—4.15 P.M. (in the Large Lecture Theatre, No. 1), Dr. Charles Singer: The Evolution of Modern Ideas of Heredity.

CHADWICK TRUST.

WEDNESDAY, March 11th.—5.15 P.M. (at the B.M.A. House, Tavistock-square, W.C.), Dame Louise McIlroy: Maternal Mortality.

BRITISH MEDICAL ASSOCIATION.

FRIDAY, March 13th (in the Great Hall, B.M.A. House, Tavistock-square, W.C.), Prof. Edward Mellanby: Diet and Health. (Sir Charles Hastings Lecture.)

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.

WEDNESDAY, March 11th.—4 P.M., Mr. George Waugh: Some Problems of Appendicitis in Childhood.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, March 9th.—12 noon, Dr. Greenfield: Pathology of Cerebral Tumours. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Hinds Howell: Disturbances of Sensation (Objective).

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Mr. Armour: The Relief of Pain by Surgical Measures.

WEDNESDAY.—2 P.M., Dr. Martin: Out-Patient Clinic.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-Patient Clinic. 3.30 P.M., Dr. Riddoch: Common Lesions of Peripheral Nerves.

FRIDAY.—2 P.M., Dr. Adie: Out-Patient Clinic. 3.30 P.M., Sir Percy Sargent: Pituitary Tumours.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE (Public Health Division), Keppel-street, Gower-street, W.C.

MONDAY, March 9th.—2 P.M., Mr. T. Dunlop Young: Meat Inspection. 5 P.M., Mr. J. C. Dawes: Public Abattoirs: Layout, General Arrangement, &c.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, March 10th.—5 P.M., Dr. J. E. M. Wigley: Pemphigus and Allied Eruptions.

THURSDAY.—5 P.M., Dr. W. K. Sibley: Electro-Therapeutics.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.

WEDNESDAY, March 11th.—4 P.M., Dr. S. Wyard: Recent Advances in the Treatment of Cancer.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.

THURSDAY, March 12th.—5 P.M., Dr. H. Burt-White: Abortion: Diagnosis and Treatment.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, March 13th.—4 P.M., Mr. Gill-Carey: Diagnosis of Sinusitis.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, March 10th.—3.15 P.M. (at the Royal Chest Hospital), Dr. P. Kerley: Radiography of Chest.

NATIONAL COUNCIL FOR MENTAL HYGIENE.

THURSDAY, March 12th.—5.15 P.M. (at 11, Chandos-street Cavendish-square, W.), Dr. J. Burnett Rae: The Psychology of Sanity.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, March 10th.—4.15 P.M., Dr. Crighton Bramwell Heart Disease Complicating Pregnancy.

FRIDAY.—4.15 P.M., Dr. F. E. Tylecote: Demonstration of Medical Cases.

ANCOATS HOSPITAL, Manchester.

THURSDAY, March 12th.—11 A.M., Dr. G. J. Langley Clinical Demonstration. 4.15 P.M., Mr. H. Platt Treatment of Fractures of the Upper Limb.

ST. MARY'S HOSPITALS, Manchester.

FRIDAY, March 13th.—4.15 P.M. (at the Whitworth-street West Hospital), Post-graduate Lecture by Dr. Dougal and Dr. Addis: Antenatal Demonstrations.

MANCHESTER VICTORIA MEMORIAL JEWISH HOSPITAL, Elizabeth-street.

WEDNESDAY, March 11th.—4.30 P.M., Mr. R. R. Kerr: The Acute Abdomen.

Vacancies

For further information refer to the advertisement columns.

All Saints' Hospital for Genito-Urinary Diseases, 91, Finchley-road.—H.S. £150.

Ashton-under-Lyne, District Infirmary.—H.S. At rate of £150.

Birmingham, Ear and Throat Hospital, Edmund-street.—H.S. At rate of £150.

Birmingham, Selly Oak Hospital.—Radiographer. £250.

Brighton, Hove and Preston Dispensary and Hove Hospital.—Hon. Surgeon to Hove Hospital.

Cambridge, Addenbrooke's Hospital.—H.S. to Special Depts. H.S. Also Res. Anæsthetist and Emergency Officer. All at rate of £130.

Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.

Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £100-£175.

Coventry and Warwickshire Hospital.—Res. H.S. £125.

Derby, Derbyshire Hospital for Women.—H.S. At rate of £150.

Dorchester, Dorset Mental Hospital, Herrison.—Jun. Asst. M.O. £100.

Dreadnought Hospital, Greenwich.—H.P. and H.S. Each at rate of £110.

East Ham Memorial Hospital, Shrewsbury-road, E.—H.S. and Cas. O. At rate of £120. H.P. At rate of £150. Also Hon. Ophthal. Surgeon.

Freemasons Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Res. M.O. At rate of £250.

Guy's Hospital Dental School, S.E.—Dental Travelling Scholarship. £150.

Harrow Hospital, Harrow-on-the-Hill, Middlesex.—Res. M.O. At rate of 140 guineas.

Hendon U.D.C.—Dentist. £550.

Hospital for Tropical Diseases, Endsleigh-gardens, W.C.—H.P. At rate of £150.

Hostel of St. Luke, 14, Fitzroy-square, W.—Res. M.O. At rate of £200.

Hull Royal Infirmary.—H.S. to Ophth, Ear, Nose, and Throat Dept. At rate of £150. Also Hon. Phys.

Ipswich, East Suffolk and Ipswich Hospital.—Two H.S.'s Each at rate of £120.

King's Lynn, West Norfolk and King's Lynn Hospital.—Sen. H.S. and Jun. H.S. At rate of £175 and £125 respectively.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

Liphook, Hants, King George's Sanatorium for Sailors.—Asst. M.O. At rate of £200.

Liverpool Seamen's Dispensary.—Part-Time Asst. V.D. M.O. £250.

Liverpool, Stanley Hospital.—H.P., Two H.S.'s, and House Gynæcological Surg. Each £100.

Liverpool, Walton Hospital.—Res. Asst. M.O.'s. £100.

L.C.C. Mental Hospital Service.—Jun. Asst. M.O. £500.

L.C.C.—Part-time Assistant Aurist for P.H. Dept. 34*s.* 6*d.* per session.

London Female Lock Hospital, 283, Harrow-road, W.—H.S. At rate of £150.

London Hospital, E.—Asst. Obstet. and Gyn. Surgeon.

Manchester, Ancoats Hospital.—Res. M.O. At rate of £150. Also Two H.S.'s. Each at rate of £100.

Manchester and District Radium Institute, Nelson-street.—Director for Radium Institute.

Manchester, Monsall Hospital for Infectious Diseases.—Jun. M.O. At rate of £350.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Manchester, St. Mary's Hospitals.—Jun. Asst. M.O. for Children's Out-patient Dept. At rate of £50.

Manchester, Withington Hospital.—Asst. M.O. At rate of £350.

Middlesex Hospital, Mortimer-street, W.—Anæsthetist for Dental Dept. 10*s.* 6*d.* per session.

Miller General Hospital, Greenwich-road, S.E.—Cas. O. At rate of £150. H.P. and H.S. Each at rate of £125. Also Anæsthetist. 52 gns.

Metropolitan Hospital, Kingsland-road, E.—Sen. H.P. and Sen. H.S. Also Jun. H.P. and Jun. H.S., and Two Cas. O.'s All at rate of £100.

Newark General Hospital.—Res. H.S. £175.

Newcastle-upon-Tyne, Newcastle General Hospital.—H.P. and H.S. Each at rate of £100.

Newport, Monmouthshire County Council.—Asst. M.O. £500.

Oldham Royal Infirmary.—H.S.'s to Special Depts. Each at rate of £175.

Portsmouth City Mental Hospital.—Jun. Asst. M.O. £350.

Portsmouth Royal Hospital.—Second H.S. Also Cas. O. At rate of £130 and £100 respectively.

Preston County Borough.—Asst. School M.O. £600.

Princess Louise Kensington Hospital for Children, St. Quintin-avenue, N. Kensington, W.—H.P. At rate of £100.

Richmond, Surrey, Royal Hospital.—Jun. J.S. At rate of £100.

Royal Free Hospital, Gray's Inn-road, W.C.—First Asst. for Children's Department. £100.

Royal National Orthopædic Hospital, 234, Great Portland-street, W. H.S. At rate of £150. Also H.S. for Country Branch, Brockley Hill, Stanmore. At rate of £150.

Royal Northern Hospital, Holloway, N.—H.P. At rate of £70.

St. Alfege's Hospital, 48, Vanbrugh-hill, Greenwich, S.E.—Asst. M.O. £350.

St. Bartholomew's Hospital, E.C.—Asst. Surgeon.

St. John's Hospital, Lewisham, S.E.—Hon. Physician.

St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. At rate of £75.

Salford Royal Hospital.—Three H.S.'s to Special Departments. Also Cas. H.S. All at rate of £125.

Salisbury, General Infirmary.—Asst. M.O. to Venereal Diseases Department.

Scarborough Hospital and Dispensary.—Two H.S.'s. Each at rate of £126.

Sheffield, Royal Hospital.—Ophth. H.S. £120. Also Res. Anæsthetist. £80–£100.

Society of Apothecaries of London, Water-lane, Queen Victoria-street, E.C.—Four Examinerships.

South London Hospital for Women, South-side, Clapham Common, S.W.—H.P. and First H.S. Each at rate of £100.

Stalybridge, Borough of.—M.O.H., &c. £800.

Taunton, Taunton and Somerset Hospital.—H.P. £100.

Wallasey Victoria Central Hospital.—Jun. H.S. At rate of £100.

Walsall General Hospital.—H.S. At rate of £150.

Watford, Herts, Peace Memorial Hospital.—Res. M.O. At rate of £150.

West Bromwich, Hallam Hospital.—Res. H.P., and Res. H.S. Each £250.

West Bromwich and District General Hospital.—Cas. H.S. At rate of £200.

West Ham County Borough, Education Committee.—Chief Asst. School M.O. £750. Also Asst. School M.O. £500.

West London Hospital, Hammersmith-road, W.—H.P., Two H.S.'s. and One Res. Anæsthetist. All at rate of £100.

Westminster Hospital, Broad Sanctuary, S.W.—Asst. H.P. At rate of £52.

Willesden General Hospital, N.W.—Hon. Clin. Asst. for Med. Out-patient Dept. Also H.P. £100.

Windsor, King Edward VII. Hospital.—H.S. At rate of £100.

Wolverhampton, Royal Hospital.—H.S. for Ear, Throat, and Nose Dept. At rate of £100.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Woking (Surrey), and Clynderwen (Pembroke).

Appointments

DUNSCOMBE, CLEMENT, M.B., B.Chir. Camb., D.P.H., has been appointed Medical Officer of Health and School Medical Officer for the County Borough of Canterbury.

HAYES, EDMUND, D. T., M.D. Dub., D.P.M., Hon. Assistant Physician to the Northampton General Hospital, to take charge of the Department of Psychological Medicine.

RODERICK, R., L.R.C.P. Lond., M.R.C.S. Eng., Assistant School Medical Officer for Newport.

URQUHART, W. S., M.B., Ch.B. Edin., D.T.M., Senior Assistant School Medical Officer for Middlesbrough.

Certifying Surgeons under the Factory and Workshop Acts: SMITH, S. L., M.B., Ch.B. Edin. (Tewkesbury); and WHITING, J. S., L.R.C.P. Lond., M.R.C.S. (Sudbury, Suffolk). AYREY, F., M.B., Ch.B. Edin. (Langport); BOOTH, G. H. H., M.B., Ch.B. Manch. (Knighton, Radnor); HAGENBACH, C. E., L.M.S.S.A. Lond. (Breage, Cornwall); JACKSON, H. H., L.M.S.S.A. Lond. (Parbold, Lancaster); and NICHOLSON, J. A., M.B., Ch.B. Aberd. (Great Haseley, Oxford).

Births, Marriages, and Deaths

BIRTHS.

BLAIR.—On Feb. 28th, at Mortlake-road, Kew Gardens, Surrey, the wife of Prof. D. M. Blair, of a daughter.

FINDLAY.—On Feb. 26th, at Blenheim-terrace, N.W., the wife of Dr. G. M. Findlay, of a daughter.

PRITCHARD.—On Feb. 25th, at St. Andrew's-street, Cambridge, the wife of Stephen Pritchard, M.R.C.S., of a son.

SAMMONS.—On Feb. 24th, at Kingswood, Bristol, the wife of Dr. R. A. Sammons, of a daughter.

SHAW.—On Feb. 23rd, at Heathcote, East Grinstead, the wife of Dr. H. B. Shaw, of a son.

DEATHS.

DE SILVA.—On Feb. 23rd, in London, Wilton Lionel de Silva, M.D., M.R.C.S., L.R.C.P., B.Ch., of Colombo, Ceylon.

DREW.—On Feb. 25th, at Thalassa, Cooden, Sussex, Douglas Drew, M.D., F.R.C.S., formerly of Wimpole-street.

HORA.—On Feb. 25th, at his residence, Cambridge-road, Cambridge Heath, N.E., Dr. Julian Hora.

LENNOX.—On Feb. 26th, at Alexandra-place, St. Andrews, David Lennox, M.D., aged 72 years.

PATERSON.—On Feb. 23rd, at Albany House, South Farnborough, Hants, Charles Edward Paterson, M.D., aged 73.

ROWLAND.—On Feb. 14th, 1931, at Georgetown, British Guiana, Edith Ellen Stratford, wife of Ernest Daniel Rowland, M.B., C.M., I.S.O., J.P., of the British Guiana Medical Service.

SMITH.—On Feb. 22nd, at Pentwyn, Pentyrch, Glam, Stanley Alwyn Smith, D.S.O., O.B.E., M.D., M.Ch., F.R.C.S.E., aged 47 years.

*N.B.—A fee of 7*s.* 6*d.* is charged for the insertion of Notices of Births, Marriages and Deaths.*

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NOTES, COMMENTS, AND ABSTRACTS

THE TREND OF MEDICAL PRACTICE.

AT a meeting of the London Jewish Hospital Medical Society on Feb. 12th Mr. Somerville Hastings, M.P., delivered an address on this subject in which he pointed out the tendency in modern medicine to take many branches of medical practice out of the hands of the general practitioner and concentrate them in some form of State organisation, while the exigencies of research were demanding further centralisation of material. This process was bound to continue, partly because it undoubtedly tended to greater efficiency and had very largely contributed to the great improvement in the general standard of physical well-being; and partly because the spirit of the age demanded collective action in the provision of its needs. It was being recognised that the team and not the individual was the true unit in medical practice, a principle which was exemplified in the work of the modern general hospital. The general practitioner should act as a liaison officer, maintaining contact with his patient throughout his treatment and coördinating the work of the team. He should have his definite place in the hospital system; and, in fact, an ideal scheme demanded the institution of district clinics as the places of first resort, rather than the private surgery or the out-patients' department of a hospital. The inability of the voluntary hospitals to provide the necessary accommodation would throw more and more work upon the new county hospitals, which must eventually rival the voluntary hospitals in the quality of their work, by reason both of greater financial backing and greater resources of material for practice, teaching, and research. The speaker advocated the inclusion of dependents in the insurance scheme, but would extend it to all classes, irrespective of income, and make it non-contributory, providing a free national service complete with specialist services, and thus opening all the resources of medicine equally to all. The cost would be borne by State funds, so that the burden would be distributed in accordance with the age-long principle of medical practice—namely, from each according to his means. Mr. Hastings thought that the increasing demand amongst the public for a form of State medical service must inevitably result in the introduction of some such system; and it behoved the medical profession to anticipate this, and ensure the creation of a fair and efficient scheme by close and sympathetic attention to the problem.

PREVENTION OF SILICOSIS.

IN a Chadwick public lecture delivered at the Royal Sanitary Institute on Feb. 24th Mr. A. E. Elsby said that in no industry, manufacturing or using finely divided silica, is the atmosphere completely free from silica dust, and maintained that the weakness of all legislation concerning dust collection lies in the fact that no limiting concentration of silica dust in the atmosphere has been specified. He discussed, in some detail, the results of A. E. Russell and co-workers (U.S. Public Health Bulletin No. 187) which have led to a permissible dust standard of 10 million particles of granite dust per cubic foot of air being proposed. As this dust contains 30–40 per cent. silica in the form of quartz, the limiting concentration calculated in terms of 100 per cent. silica, of particle size less than 10 microns and correctly estimated, would be 3 million particles per cubic foot of air; a figure which can be obtained in industry if correctly designed plant is installed and maintained. The determination of the amount of silica dust in the atmosphere, said the lecturer, is a matter of some difficulty, and he recommended the impinger method described in U.S. Public Health Bulletin No. 144 in preference to Dr. Owens's dust counter, because of the advantages of chemical analysis of the dust collected, of more accurate dust counting, and greater efficiency at high concentrations. In Mr. Elsby's opinion, failure of dust-collection systems is generally due to the installation of unsuitable collectors. The cyclone collector is appropriate in cases where 60–70 per cent. collection is sufficient and the very fine dust can be vented to the atmosphere. This is very rarely possible, owing to nuisance, and in general, complete collection is necessary. The most satisfactory type of collector under all conditions is the bag filter or cloth screen in which the filter is mechanically shaken and subjected to periodical reversed air-blast. A collector of this type can deal with air containing grs. 15 of silica per cubic foot, allowing 1 foot of filtering area per 3 cubic feet of air per minute.

The lecture concluded with the suggestion that the plant manufacturer who guaranteed his system to bring the dust concentration down to the limiting figure previously mentioned would be doing much to reduce the incidence of silicosis.

NEW PREPARATIONS.

T.C.P. BRONCHIAL ANTIDOTE.—The British Alkaloids, Ltd., Winchester House, London, E.C.2, have added to their T.C.P. (trichlorophenylmethyliodosalicyl) preparations a form particularly for the treatment of affections of the respiratory organs. The disinfectant, T.C.P., was noticed in THE LANCET recently (Jan. 11th, 1930, page 114), and it is claimed for the new preparation, which is slightly alkaline, that a chemical reaction takes place on ingestion which results in the secretions of the bronchi being not only disinfected but liquefied, thus facilitating their expulsion. The preparation is put up in 2 oz. and 8 oz. bottles and the dose for adults is a tablespoonful to be taken night and morning in an equal quantity of water, the dose for children being much smaller and regulated according to the age of the child. The preparation should be taken in accordance with medical advice.

INTERNATIONAL FELLOWSHIPS FOR RESEARCH.

THE International Federation of University Women has published a handbook on international fellowships[1] which supplies in a concise tabular form the information needed by graduates and research workers who would like to pursue their work abroad. The list is divided into two parts, dealing with fellowships available for graduates of particular countries, and with those available for all students. A surprising amount of help is to be had in this way; over 210 pages are occupied in setting out in the shortest possible form the subject of each fellowship, where it is tenable, its duration, value, and conditions, and the place where application should be made. Graduates of the universities of Great Britain alone will find 27 pages devoted to fellowships available for them in other countries.

There is little doubt of the value of these fellowships. As the preface to the pamphlet points out, there are two critical periods in a research worker's career: the first is in the early days, when he needs to spend some years under an experienced colleague before he can apply for a post which will enable him to do investigation and at the same time provide an adequate salary. The second stage is an interim period when he is qualified for a good appointment but a teaching post does not happen to be vacant; the need to earn his living may deflect him into commerce or industry at this point. For certain kinds of work, moreover, an appointment abroad is not merely a luxury but a necessity. Books, manuscripts, flora, and fauna of particular kinds are only available at particular places, and there are only three laboratories in the world where experiments

[1] Pamphlet No. 4. Crosby Hall, Cheyne Walk, London, S.W.3. 1930. 1s.

at very low temperatures can be carried on. Apart from peculiar difficulties of this kind, nobody will dispute the immense value to a laboratory worker of friendly contact with workers on the same subject in other countries.

The establishment of international fellowships has always held a prominent place in the programme of the International Federation of University Women, and the valuable work the Federation has already done is further enhanced by the publication of this handbook.

BRADSHAW'S CONTINENTAL HANDBOOK.

THIS attractive little book will be a veritable godsend to any who would a travelling go and do not know where or how. It contains general information about continental travel and foreign money, followed by notes on each European country in turn, including Algeria, Tunisia, Morocco, Egypt, the Sudan, and Palestine, a sufficiently extensive and well-filled programme. There is also a directory of bathing resorts and spas, enumerating the chemical constituents of the waters and the diseases for which they are recommended. The book, indeed, goes far to fulfil its promise of giving in a condensed form details of everything worth seeing in the wide area it covers. Conversely there is a section which will initiate the foreign visitor into the pleasant resorts of the British Isles. At the end is a very complete list of hotels. The price is 3*s*. 6*d*.

EVERYMAN'S PSYCHOLOGY.

THOSE who are acquainted with the educational writings of Sir John Adams already know that it is impossible for him to write a dull book. Readers of Everyman's Psychology [1] will find that the style of approach is singularly unprofessorial. Lesser minds would shrink from the pungent discourse and illustration which Sir John Adams uses with such success; but the result is a clarified atmosphere devoid of stuffy terminology and heavy phrase. His racy manner, however, is frequently used to pour ridicule on some very excellent psychological theories—notably those to which the author does not himself subscribe. This may lead the novice in psychology to share not only the author's humour but his opinions too. His treatment of the Freudian psychology, for example, is benevolent but inaccurate. However, the subject matter is presented from a new angle, a particularly human one, and readers who take up the book are not likely to put it down unfinished.

DISPENSING OPTICIANS.

THE Association of Dispensing Opticians, now in its fourth year, has issued a manifesto giving reasons why its members should receive the support of the medical profession and the public. Being pledged to refrain from supplying glasses except to the prescription of a medical man, they are free to devote themselves to their proper work—viz., the accurate dispensing of ophthalmic prescriptions, the design and accurate fitting of spectacle frames, and also the design and manufacture of ophthalmic instruments and apparatus for the use of ophthalmic surgeons. For many years the latter have deplored the fact that the great majority of the middle classes, when they find their eyesight to be defective, apply in the first place to a prescribing optician, with the consequences that some people with diseases which demand ophthalmic or general treatment do not get it until too late, others wear glasses which are incorrect, and others are induced to wear them when it is really unnecessary for them to wear glasses at all. Opticians are divided into two camps, the prescribing opticians who claim that the work of testing refraction properly belongs to them, and the purely dispensing opticians, who definitely renounce any such claim. At present the Association consists of some 20 London firms, most of whom have branches in the outer suburbs and in provincial centres all over England and Wales. A few firms belong who are not represented in London. Altogether, considerably over 100 provincial branches exist. It is the declared intention of the members of the Association to remedy the low standard of optical dispensing which prevails generally throughout the country. Members are divided into four main sections: employers, managers, assistants, and craftsmen; there are also associate members who, before being admitted to membership, have to give guarantees of competence in their work. The Association deserves the support of the medical profession and of the public. No doubt the competition between ophthalmic surgeons and dispensing opticians on the one hand, and prescribing opticians on the other, will continue for some time yet, but the public will ultimately support the system which best serves its needs. Where eyesight is concerned they are not likely to be permanently satisfied with anything short of the best.

FAT-SOLUBLE VITAMINS IN FISH.

IN a report from the State Vitamin Institute in Norway, Prof. E. Poulsson gives in the *Norsk Magazin for Laegevidenskaben* for February some further information about the distribution of the fat-soluble vitamins in different species of fish and also in the same species caught in different parts of the world. We lately referred [1] to a report by Prof. J. C. Drummond and Prof. T. P. Hilditch, concluding that in vitamin content the Newfoundland cod outstrips its Norwegian competitor, but Prof. Poulsson adduces evidence once more in the opposite direction. In 1929, he says, he examined 58 samples of Norwegian cod-liver oil, and found that the minimum effectively antirachitic daily dose was about 4 mg. or between 4 and 5 mg. Only exceptionally was it as high as 6 mg., and in some cases it was as low as 3 mg. At the same time 39 samples of Newfoundland cod-liver oil were examined, and approximately twice as much, he says, had to be given to achieve the same result.

The popularity of cod-liver oil as compared with that of the liver oil of other fish seems to depend on the regularity of supply. The cod times its arrival in certain places and at certain seasons with great precision and comes in almost fabulous numbers, so that a regular and sufficient supply of cod-liver oil can always be counted on. But not only do the 70 to 80 members of the cod family harbour just as much vitamin as the cod itself, but many other fish actually excel it in this respect. The shark family in particular produces liver oil containing weight for weight several times more vitamin A than the cod family. The savage dogfish, which frequents the northernmost coast of Norway, and which runs to several metres in length, produces an oil containing twice as much vitamin A as does cod-liver oil, and the most common European shark possesses an oil with eight times as much. On the other hand, the shark's liver contains only about a tenth of the vitamin D found in the liver of the cod. The sluggish and peaceful giant shark, which may run to 20 to 30 metres, has a liver containing hardly any vitamin D. Prof. Poulsson suggests that the almost complete absence of the antirachitic, bone-developing vitamin in this shark is connected with the cartilaginous character of its skeleton. Confirmation of this hypothesis has been found in the observation that in other fish also, whose skeletons are composed of cartilage and connective tissue rather than of bone, the content of vitamin D in the liver oil is remarkably low.

The Boat Race.—Bemax laboratories, whose factory overlooks the river at Hammersmith, are offering medical men an opportunity of viewing in comfort the boat race on March 21st. Only 300 seats are available and inquiries will be dea't with in rotation.

[1] By Sir John Adams, late Professor of Education, London University. London: University of London Press. Pp. 427. 10*s*. 6*d*.

[1] THE LANCET, Jan. 16th, p. 91.